정답 및 해설

빠른 정답

Ⅰ. 대푯값과 산포도

01. 중앙값 (본문 8쪽)

01 4
02 17
03 69
04 23
05 4
06 33
07 5
08 ③
09 7, 6
10 9
11 6
12 5
13 35
14 2, 6
15 19
16 23
17 70

02. 최빈값 (본문 10쪽)

01 3
02 23
03 9
04 12
05 6, 6
06 2, 4
07 1, 8
08 최빈값은 없다.

03. 평균 (본문 11쪽)

01 8, 9, 20, 5
02 45
03 8
04 50
05 5
06 6
07 5
08 6, 24, 6
09 90
10 4
11 60
12 30
13 27
14 9
15 1
16 2, 10, 10, 5
17 6
18 5, 10, 4, 10, 4, 12
19 5.6
20 7
21 20

04. 편차 (본문 14쪽)

01 -2, 2
02 10, -20
03 0, -1, 3
04 30, 20, 5
05 13, 5, 9, 11
06 8, 9, 1, 3
07 15, 30, -3, -5
08 4, 4, 5, 5, 4
09 -35
10 -4
11 34
12 5, 5, 9
13 -3, 0, 2, 3, -2
14 -5, 6, 4, -15, 10
15 -4, 18, 2, -6, 5, -15
16 2
17 -6
18 6
19 -5
20 0
21 -5
22 -4
23 3

05. 분산과 표준편차 (본문 17쪽)

01 (1) 2, 16 (2) 16, 4 (3) 2
02 (1) 24 (2) 6 (3) $\sqrt{6}$
03 (1) 50 (2) 10 (3) $\sqrt{10}$
04 (1) 48 (2) 8 (3) $2\sqrt{2}$
05 (1) 3 (2) 20 (3) 20, 5 (4) $\sqrt{5}$
06 (1) -2 (2) 24 (3) 6 (4) $\sqrt{6}$
07 (1) -1 (2) 40 (3) 8 (4) $2\sqrt{2}$
08 (1) 1 (2) 42 (3) 7 (4) $\sqrt{7}$
09 (1) 5, 5 (2) 5, 20, 4 (3) 4, 2
10 (1) 15 (2) 6 (3) $\sqrt{6}$
11 (1) 28 (2) 20 (3) $2\sqrt{5}$
12 (1) 10 (2) 4 (3) 2
13 40, 10
14 4
15 20
16 ×
17 ×
18 ×
19 ×
20 ○
21 ×
22 ×

06. 도수분포표에서의 분산과 표준편차 (본문 21쪽)

01 600, 60
02 26
03 113
04 5
05 48
06 12
07 4.3
08 1.8
09 5.2
10 10.3
11 (1) 4 (2) 2, 4, 50, 5 (3) 4, 32, 3.2
12 (1) 3 (2) 4 (3) 1.4
13 (1) 4 (2) 6 (3) 4.8
14 (1) 5 (2) 6 (3) 5.4
15 평균 42, 분산 256, 표준편차 16
16 평균 21, 분산 64, 표준편차 8
17 평균 4, 분산 3, 표준편차 $\sqrt{3}$
18 평균 60, 분산 500, 표준편차 $10\sqrt{5}$
19 평균 50, 분산 480, 표준편차 $4\sqrt{30}$
20 평균 100, 분산 720, 표준편차 $12\sqrt{5}$

Ⅱ. 피타고라스 정리

01. 피타고라스의 정리 (본문 30쪽)

01 3, 25, 5
02 $3\sqrt{2}$
03 13
04 15
05 $\sqrt{11}$
06 $\frac{5\sqrt{2}}{2}$
07 $9\sqrt{5}$ cm^2
08 3, 16, 4, 4, 48, 3
09 $x=8$, $y=10$
10 $x=3$, $y=5$
11 $x=3$, $y=4\sqrt{2}$
12 $x=\sqrt{7}$, $y=\sqrt{43}$
13 $x=5$, $y=20$
14 $x=10$, $y=9$
15 $x=3$, $y=5$
16 3, 5, 5, 29
17 $2\sqrt{22}$
18 2
19 $\sqrt{37}$
20 $\sqrt{10}$
21 $2\sqrt{7}$
22 $\sqrt{5}$

02. 피타고라스 정리의 증명 – 유클리드의 증명 (본문 33쪽)

01 25
02 64 cm^2
03 16 cm^2

04 100, 100, 10
05 5 cm
06 2 cm
07 36
08 12, 144
09 ACH, 6, 18
10 18 cm^2
11 50 cm^2
12 72 cm^2

03. 피타고라스 정리의 증명 – 피타고라스의 증명 (본문 35쪽)

01 3, 3, 5, 5, 20
02 68
03 $8\sqrt{5}$
04 12
05 3, 3, $\sqrt{34}$, $\sqrt{34}$, 34
06 225
07 169
08 5, 5, 4, 2, 2, 3, 3, 9
09 100
10 196

04. 피타고라스 정리의 증명 – 바스카라의 증명 (본문 37쪽)

01 ○
02 ○
03 ×
04 ○
05 ○
06 5, 3
07 2
08 7
09 7, 3, 3, 9
10 49
11 49
12 9
13 9
14 4

05. 피타고라스 정리의 증명 – 가필드의 증명 (본문 39쪽)

01 6, 52, 52, 52
02 45
03 29
04 45, 90, 90, 9, 3, 3, 12
05 98
06 15, 15, 9, 9, 6, 12, 12, 6, $\frac{9}{2}$
07 $\frac{26}{3}$
08 12, 12, 8, $\frac{10}{3}$, $\frac{10}{3}$, $\frac{40}{3}$
09 $\frac{21}{16}$

06. 피타고라스 정리의 역 (본문 41쪽)

01 ○, 3, 2, 직각삼각형이다
02 ×
03 ×
04 ○
05 ×
06 ○
07 6, 32, 8
08 16
09 11

07. 직각삼각형의 닮음을 이용한 성질 (본문 42쪽)

01 $x=3$, $y=\sqrt{3}$, $z=2\sqrt{3}$
02 $x=\frac{7}{3}$, $y=\sqrt{7}$, $z=\frac{4\sqrt{7}}{3}$
03 $x=\frac{16}{3}$, $y=5$, $z=\frac{20}{3}$
04 $x=\frac{9}{2}$, $y=10$, $z=\frac{15}{2}$
05 $x=3\sqrt{2}$, $y=3\sqrt{3}$, $z=3\sqrt{6}$
06 $x=4\sqrt{3}$, $y=4\sqrt{7}$, $z=2\sqrt{21}$
07 5, 3, $\frac{12}{5}$
08 $\frac{4\sqrt{5}}{3}$
09 $3\sqrt{3}$, $3\sqrt{3}$, $\frac{3\sqrt{3}}{2}$
10 $\frac{120}{17}$
11 100, 10, 10, $\frac{18}{5}$, 10, $\frac{24}{5}$
12 $x=17$, $y=\frac{64}{17}$, $z=\frac{120}{17}$
13 $x=8$, $y=\frac{24}{5}$, $z=\frac{32}{5}$
14 $x=12$, $y=\frac{60}{13}$, $z=\frac{25}{13}$

08. 직각삼각형 안에서 교차하는 두 선분의 성질 (본문 44쪽)

01 $\overline{\text{CD}}$, 5, 61
02 277
03 100
04 $\overline{\text{CD}}$, 7
05 $2\sqrt{14}$
06 $4\sqrt{5}$

09. 두 대각선이 직교하는 사각형의 성질 (본문 45쪽)

01 5, 61
02 34
03 100
04 116
05 6, 7
06 $\sqrt{5}$
07 $2\sqrt{31}$

10. 직사각형의 내부에 한 점이 있을 때 (본문 46쪽)

01 6, 45
02 41
03 29
04 74
05 6, 5, 5, $\sqrt{5}$
06 $3\sqrt{2}$
07 $\sqrt{11}$
08 7

11. 직각삼각형의 세 반원 사이의 관계 (본문 47쪽)

01 12π, 18π
02 18π
03 40π
04 32π
05 4, 8π, 8π, 34π
06 $\frac{45}{2}\pi$
07 8π

12. 히포크라테스의 원의 넓이 (본문 48쪽)

01 7, 12
02 24 cm^2
03 7 cm^2
04 19 cm^2
05 8, 24
06 30 cm^2
07 17 cm

13. 직사각형의 대각선의 길이 (본문 49쪽)

01 4, $2\sqrt{13}$
02 $5\sqrt{5}$ cm
03 13 cm
04 $2\sqrt{41}$ cm
05 $5\sqrt{2}$ cm
06 $7\sqrt{2}$ cm
07 4 cm
08 10 cm
09 3, 4
10 $2\sqrt{3}$
11 $3\sqrt{7}$
12 $5\sqrt{2}$
13 6, 64, 8, 48
14 $32\sqrt{5}$ cm^2
15 $8\sqrt{5}$ cm^2
16 25 cm^2

14. 정삼각형의 높이와 넓이 (본문 51쪽)

01 2, $\sqrt{3}$
02 $\frac{5\sqrt{3}}{2}$ cm
03 $4\sqrt{3}$ cm
04 3 cm
05 4, $4\sqrt{3}$
06 $9\sqrt{3}$ cm^2
07 $18\sqrt{3}$ cm^2
08 $12\sqrt{3}$ cm^2
09 $\frac{\sqrt{3}}{2}$, 5

10 4

11 8

12 4

13 $3\sqrt{3}$, 6, 6, $9\sqrt{3}$

14 $12\sqrt{3}$

15 $2\sqrt{3}$

16 $32\sqrt{3}$

15. 이등변삼각형과 일반 삼각형의 높이와 넓이 (본문 53쪽)

01 8, $2\sqrt{5}$

02 $2\sqrt{10}$ cm

03 $4\sqrt{6}$ cm

04 6, 16, 4, 4, 12

05 $8\sqrt{2}$ cm^2

06 $10\sqrt{6}$ cm^2

07 $\frac{4\sqrt{5}}{3}$

08 $\frac{2\sqrt{14}}{3}$

09 $\frac{3\sqrt{15}}{4}$

10 $10\sqrt{3}$

11 $15\sqrt{7}$

12 $6\sqrt{6}$

16. 특수한 직각삼각형의 세 변의 길이의 비 (본문 55쪽)

01 $\sqrt{2}$, $2\sqrt{2}$, 1, 2

02 $x=8$, $y=4\sqrt{3}$

03 $x=3$, $y=3$

04 $x=3$, $y=3\sqrt{3}$

05 $x=5$, $y=5\sqrt{2}$

06 $x=12$, $y=6$

07 $x=4\sqrt{2}$, $y=4\sqrt{2}$

08 $x=2\sqrt{3}$, $y=2$

09 $6\sqrt{2}$, 6, 6, 12

10 $x=4\sqrt{3}$, $y=4\sqrt{6}$

11 $x=6\sqrt{3}$, $y=3\sqrt{6}$

12 $x=4\sqrt{3}$, $y=4\sqrt{6}$

13 $x=4\sqrt{3}$, $y=8$

14 2, 16

15 $x=3$, $y=\frac{3\sqrt{6}}{2}$

16 $x=4\sqrt{3}$, $y=4\sqrt{6}$

17 1, 2, 2, 14

18 $30\sqrt{2}$

19 $40\sqrt{2}$

20 $60\sqrt{3}$

21 $\sqrt{3}$, $2\sqrt{3}$, 1, 2, 2, 2, $2\sqrt{3}$, $14\sqrt{3}$

22 $33\sqrt{3}$

23 $12\sqrt{3}+6$

17. 좌표평면 위의 두 점 사이의 거리 (본문 58쪽)

01 4, 25, 5

02 $2\sqrt{5}$

03 $\sqrt{13}$

04 $\sqrt{10}$

05 $5\sqrt{2}$

06 1, 1, 25, 5

07 $\sqrt{29}$

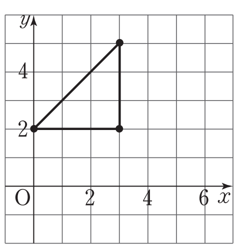
08 $5\sqrt{2}$

09 $3\sqrt{2}$

10 $\sqrt{13}$

11 $\sqrt{53}$

12



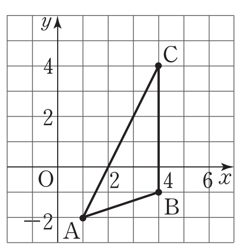
13 3

14 3

15 $3\sqrt{2}$

16 직각삼각형

17



18 $\sqrt{10}$

19 5

20 $3\sqrt{5}$

21 둔각삼각형

18. 직육면체의 대각선의 길이 (본문 60쪽)

01 3, 5, $5\sqrt{2}$

02 $2\sqrt{6}$ cm

03 $\sqrt{155}$ cm

04 $\sqrt{78}$ cm

05 2, $2\sqrt{3}$

06 $3\sqrt{3}$ cm

07 $9\sqrt{3}$ cm

08 6 cm

09 7, 40, 49, 9, 3

10 $5\sqrt{3}$

11 $4\sqrt{3}$

12 $2\sqrt{19}$

13 $\sqrt{3}$, 4

14 10

15 $4\sqrt{3}$

16 $5\sqrt{3}$

17 $6\sqrt{2}$ cm

18 $6\sqrt{2}$ cm

19 $6\sqrt{2}$ cm

20 정삼각형

21 $6\sqrt{2}$, $18\sqrt{3}$

22 $10\sqrt{2}$ cm

23 $10\sqrt{2}$ cm

24 $10\sqrt{2}$ cm

25 정삼각형

26 $50\sqrt{3}$ cm^2

19. 정사각뿔의 높이와 부피 (본문 63쪽)

01 $4\sqrt{2}$, $2\sqrt{2}$, $2\sqrt{2}$, 28, $2\sqrt{7}$, $2\sqrt{7}$, $\frac{32\sqrt{7}}{3}$

02 높이 $3\sqrt{2}$ cm,
부피 $36\sqrt{7}$ cm^3

03 높이 $3\sqrt{2}$ cm,
부피 $36\sqrt{14}$ cm^3

04 높이 $5\sqrt{2}$ cm,
부피 $\frac{500\sqrt{7}}{3}$ cm^3

05 $36\sqrt{2}$ cm^3

20. 정사면체의 높이와 부피 (본문 64쪽)

01 3, $\sqrt{6}$, 3, $\frac{9\sqrt{2}}{4}$

02 높이 $2\sqrt{6}$ cm,
부피 $18\sqrt{2}$ cm^3

03 높이 $4\sqrt{6}$ cm,
부피 $144\sqrt{2}$ cm^3

04 높이 $2\sqrt{3}$ cm,
부피 9 cm^3

05 높이 12 cm,
부피 $216\sqrt{3}$ cm^3

06 $\frac{\sqrt{6}}{3}$, 4

07 $\frac{\sqrt{3}}{2}$, $3\sqrt{2}$

08 $3\sqrt{2}$, $\sqrt{2}$

09 $\sqrt{2}$, 4, $2\sqrt{2}$

10 $\frac{\sqrt{3}}{2}$, $2\sqrt{3}$

11 $\frac{\sqrt{3}}{2}$, $2\sqrt{3}$

12 $2\sqrt{3}$, $2\sqrt{3}$, 이등변삼각형

13 $2\sqrt{3}$, 2, 8

14 $2\sqrt{2}$, $4\sqrt{2}$

21. 원뿔의 높이와 부피 (본문 66쪽)

01 64, 8, 8, 96π

02 높이 $3\sqrt{15}$ cm,
부피 $9\sqrt{15}\pi$ cm^3

03 높이 $3\sqrt{5}$ cm,
부피 $36\sqrt{5}\pi$ cm^3

04 높이 $2\sqrt{7}$ cm,
부피 $24\sqrt{7}\pi$ cm^3

05 높이 $2\sqrt{14}$ cm,
부피 $\frac{50\sqrt{14}}{3}\pi$ cm^3

06 높이 6 cm,
부피 128π cm^3

07 $120°$, 1

08 1, $2\sqrt{2}$

09 1, $2\sqrt{2}$, $\frac{2\sqrt{2}}{3}$

10 8

11 $4\sqrt{5}$ cm

12 $\frac{256\sqrt{5}}{3}\pi$ cm^3

13 120

14 $4\sqrt{2}$ cm

15 $\frac{16\sqrt{2}}{3}\pi$ cm^3

22. 입체도형에서의 최단 거리 (본문 68쪽)

01 10, 2, 5, 13
02 3, 5, 6, 10
03 12π, 15π
04 $4\sqrt{3}\pi$, 8π

Ⅲ. 삼각비

01. 삼각비의 뜻 (본문 74쪽)

01 $\frac{3}{5}$, $\frac{4}{5}$, $\frac{3}{4}$
02 $\sin A=\frac{5}{13}$, $\cos A=\frac{12}{13}$, $\tan A=\frac{5}{12}$
03 $\sin A=\frac{3}{5}$, $\cos A=\frac{4}{5}$, $\tan A=\frac{3}{4}$
04 $\sin A=\frac{\sqrt{2}}{2}$, $\cos A=\frac{\sqrt{2}}{2}$, $\tan A=1$
05 $\sin A=\frac{\sqrt{5}}{5}$, $\cos A=\frac{2\sqrt{5}}{5}$, $\tan A=\frac{1}{2}$
06 $\frac{3}{5}$, $\frac{3}{5}$, $\frac{4}{3}$
07 $\sin C=\frac{4}{5}$, $\cos C=\frac{3}{5}$, $\tan C=\frac{4}{3}$
08 $\sin C=\frac{15}{17}$, $\cos C=\frac{8}{17}$, $\tan C=\frac{15}{8}$
09 $\sin C=\frac{12}{13}$, $\cos C=\frac{5}{13}$, $\tan C=\frac{12}{5}$
10 $\sin C=\frac{2\sqrt{5}}{5}$, $\cos C=\frac{\sqrt{5}}{5}$, $\tan C=2$
11 $\sin C=\frac{\sqrt{2}}{2}$, $\cos C=\frac{\sqrt{2}}{2}$, $\tan C=1$
12 $\sin C=\frac{3\sqrt{13}}{13}$, $\cos C=\frac{2\sqrt{13}}{13}$, $\tan C=\frac{3}{2}$
13 $\sin C=\frac{\sqrt{3}}{2}$, $\cos C=\frac{1}{2}$, $\tan C=\sqrt{3}$
14 $\frac{\sqrt{2}}{2}$
15 $\sqrt{6}$
16 6
17 4
18 $\frac{4\sqrt{3}}{3}$
19 $\frac{3}{2}$

02. 한 삼각비가 주어질 때, 나머지 삼각비의 값 (본문 77쪽)

01 4, $\frac{4}{5}$, $\frac{3}{4}$
02 $\sin A=\frac{\sqrt{3}}{2}$, $\tan A=\sqrt{3}$
03 $\sin A=\frac{2\sqrt{13}}{13}$, $\cos A=\frac{3\sqrt{13}}{13}$
04 $\cos C=\frac{12}{13}$, $\tan C=\frac{5}{12}$

03. 직각삼각형의 닮음을 이용한 삼각비의 값 (본문 78쪽)

01 DBA, C, C, $\frac{4}{5}$
02 $\frac{3}{5}$
03 $\frac{4}{3}$
04 $\frac{3}{5}$
05 $\frac{4}{5}$
06 $\frac{3}{4}$
07 5
08 $\frac{3}{5}$
09 $\frac{4}{5}$
10 $\frac{4}{5}$
11 $\frac{3}{5}$
12 $\frac{15}{17}$
13 $\frac{8}{17}$
14 $\frac{3\sqrt{10}}{10}$
15 $\frac{\sqrt{10}}{10}$

04. 직육면체에서의 삼각비 (본문 80쪽)

01 (1) $4\sqrt{2}$, H, $4\sqrt{2}$, $\frac{\sqrt{2}}{2}$
(2) $4\sqrt{3}$, $4\sqrt{3}$, $\frac{\sqrt{3}}{3}$
(3) $\frac{\sqrt{6}}{3}$
02 (1) $\frac{\sqrt{2}}{2}$ (2) $\frac{\sqrt{3}}{3}$ (3) $\frac{\sqrt{6}}{3}$
03 (1) $\frac{\sqrt{2}}{2}$ (2) $\frac{\sqrt{3}}{3}$ (3) $\frac{\sqrt{6}}{3}$

05. 특수각의 삼각비 (본문 81쪽)

01 $\frac{\sqrt{2}}{2}$, $\sqrt{2}$
02 $\sqrt{3}$
03 $\frac{\sqrt{3}}{6}$
04 $\frac{1}{2}$
05 1
06 $\frac{\sqrt{6}}{3}$
07 $\sqrt{2}$
08 2
09 45°, 45°
10 30°
11 60°
12 60°
13 45°
14 45°
15 30°
16 60°
17 30°
18 $2\sqrt{3}$, $2\sqrt{3}$, 4
19 4
20 6
21 6
22 6, 6
23 2
24 $4(\sqrt{3}-1)$
25 $\frac{3\sqrt{6}}{2}$
26 $4\sqrt{6}$
27 $2\sqrt{6}$
28 $\frac{\sqrt{3}}{3}$
29 1
30 $-\frac{\sqrt{3}}{3}$
31 $-\sqrt{3}$
32 $\sqrt{3}$, $\sqrt{3}$
33 $y=x+4$
34 $y=\frac{\sqrt{3}}{3}x+1$

06. 사분원과 임의의 예각의 삼각비 (본문 85쪽)

01 ○
02 ×, $\overline{OB}$, $\overline{OB}$
03 ×
04 ○
05 ×
06 ○
07 0.8192
08 0.5736
09 1.4281
10 0.5736
11 0.8192

07. 0°, 90°의 삼각비의 값 (본문 86쪽)

01 0
02 0
03 정할 수 없다.
04 1
05 0
06 1
07 0

08 0
09 1
10 $\frac{1}{2}$
11 -1
12 $1-\frac{\sqrt{3}}{2}$

08. 삼각비의 대소 관계 (본문 87쪽)

01 $>$
02 $<$
03 $>$
04 $>$
05 $>$
06 $<$
07 $>$
08 $>$
09 $>$
10 $=$
11 $>$

09. 삼각비의 표 (본문 88쪽)

01 0.7771
02 0.7986
03 0.6157
04 0.5878
05 1.2799
06 1.3764
07 $83°$
08 $82°$
09 $82°$
10 $85°$
11 $84°$
12 $84°$
13 0.5736, 5.736
14 3.993
15 5.812
16 7.3884
17 $47°$, $47°$, 0.6820, 68.2
18 75.47
19 144

10. 직각삼각형의 변의 길이 (본문 90쪽)

01 $c\sin B$
02 $c\cos B$
03 $a\tan B$
04 $c\sin A$
05 $c\cos A$
06 $b\tan A$
07 (1) $6\sqrt{2}$ (2) 6
08 (1) 4 (2) $4\sqrt{3}$
09 (1) 10, 8 (2) 10, 6
10 (1) 30 (2) 24.3
11 (1) 6 (2) 5
12 (1) 8 (2) 6
13 3, $3\sqrt{3}$, 3, $3\sqrt{3}$, $27\sqrt{3}$
14 192 cm^3
15 $72\sqrt{3}\pi\text{ cm}^3$
16 1.43, 4.29
17 54.8 m
18 1, 0.58, 15.8

11. 일반 삼각형의 변의 길이 (1) (본문 93쪽)

01 $4\sqrt{3}$
02 4
03 8
04 $4\sqrt{7}$
05 $\sqrt{21}$
06 5
07 $2\sqrt{21}$

12. 일반 삼각형의 변의 길이 (2) (본문 94쪽)

01 $4\sqrt{2}$
02 $\frac{8\sqrt{6}}{3}$
03 $45°$
04 4
05 $45°$, $45°$, 4, $\frac{1}{\sqrt{2}}$, $4\sqrt{2}$
06 $60°$, $60°$, $60°$, 6, $\frac{\sqrt{3}}{2}$, $4\sqrt{3}$
07 $2\sqrt{6}$
08 $6\sqrt{2}$
09 $\frac{8\sqrt{3}}{3}$
10 $10\sqrt{2}$

13. 예각삼각형의 높이 (본문 96쪽)

01 $40°$, $50°$, $50°$
02 $55°$, $35°$, $35°$
03 $50°$, $35°$, $50°$, $35°$
04 $2\sqrt{3}-2$
05 $\frac{3\sqrt{3}}{2}$
06 $12-4\sqrt{3}$

14. 둔각삼각형의 높이 (본문 97쪽)

01 $40°$, $50°$, $50°$
02 $70°$, $20°$, $20°$
03 $50°$, $20°$, $50°$, $20°$
04 12, 12, 36
05 $15+5\sqrt{3}$
06 $4\sqrt{3}+4$

15. 삼각형의 넓이 (본문 98쪽)

01 $45°$, $\frac{\sqrt{2}}{2}$, $12\sqrt{2}$
02 $10\sqrt{2}$
03 6
04 $45°$, $90°$, 1, 50
05 12
06 $5\sqrt{3}$
07 $150°$, $\frac{1}{2}$, 14
08 9
09 6
10 21
11 $120°$, $\frac{\sqrt{3}}{2}$, 27
12 12
13 $16\sqrt{3}$
14 $25\sqrt{2}$
15 6, $\sin 30°$, 6, $\frac{1}{2}$
16 $40+3\sqrt{51}$
17 $27\sqrt{3}$
18 4, 4, $\frac{\sqrt{3}}{2}$, $24\sqrt{3}$
19 $54\sqrt{3}$
20 $50\sqrt{2}$

16. 사각형의 넓이 (본문 101쪽)

01 $60°$, $\frac{\sqrt{3}}{2}$, $24\sqrt{3}$
02 30
03 12
04 56
05 9
06 20
07 $150°$, $\frac{1}{2}$, 25
08 35
09 15
10 18
11 $9\sqrt{2}$
12 64
13 10
14 18

Ⅳ. 원의 성질

01. 중심각과 현, 호의 길이 (본문 108쪽)

01 8
02 10
03 15
04 $120°$
05 $80°$
06 $130°$
07 4
08 8
09 12
10 15
11 $50°$
12 $80°$
13 $130°$
14 $100°$

02. 현의 수직이등분선 (본문 110쪽)

01 4, 4

02 6
03 7
04 9
05 3, 4, 8
06 16
07 $2\sqrt{11}$
08 $8\sqrt{3}$
09 $\sqrt{41}$
10 5
11 4, 5
12 $\frac{5}{2}$
13 2, 2, 4, $\frac{13}{4}$
14 15
15 $\frac{13}{2}$
16 $\frac{15}{2}$

03. 현의 길이 (본문 112쪽)

01 6
02 16
03 10
04 7
05 4
06 8
07 8
08 12
09 $8\sqrt{2}$
10 $4\sqrt{3}$
11 $55°$, $70°$
12 $40°$
13 $70°$
14 $65°$

04. 원의 접선의 길이 (본문 114쪽)

01 ×
02 ○
03 ×
04 ○
05 ○
06 $90°$, $180°$
07 $30°$
08 $120°$
09 2, 12, $2\sqrt{3}$
10 12
11 $\sqrt{91}$
12 4
13 4, 4, 6
14 60 cm^2
15 30 cm^2
16 $4\sqrt{5}$ cm^2

05. 삼각형의 내접원 (본문 116쪽)

01 10, 10, 4
02 5
03 $\frac{9}{2}$
04 6, 7, 8, $\frac{21}{2}$
05 15
06 15
07 6, 6, 6, 10, 2
08 2
09 1
10 3
11 10, 2, 2, 4
12 π cm^2
13 9π cm^2
14 4π cm^2

06. 외접사각형의 성질 (본문 118쪽)

01 ×
02 ○
03 ×
04 ×
05 ×
06 ○
07 10, 6, 9
08 9
09 8
10 5
11 7, 8, 4
12 7
13 20
14 3
15 3, 3, 3, 3
16 4
17 9
18 5

07. 원주각과 중심각의 크기 (본문 120쪽)

01 $\frac{1}{2}$, $25°$
02 $65°$
03 $40°$
04 $30°$
05 $50°$
06 $42°$
07 2, 2, $150°$
08 $60°$
09 $90°$
10 $80°$
11 2, $220°$, $140°$, $140°$, $70°$
12 $50°$
13 $60°$
14 $65°$
15 $130°$, $130°$, $65°$
16 $60°$
17 $57°$
18 $52°$
19 $70°$
20 $66°$
21 $62°$
22 $47°$

08. 원주각의 성질 (본문 123쪽)

01 $25°$
02 $50°$
03 $55°$
04 $30°$, 2, $60°$
05 $\angle x=55°$, $\angle y=110°$
06 $\angle x=25°$, $\angle y=50°$
07 $90°$, $90°$, $60°$
08 $45°$
09 $40°$
10 $20°$
11 $90°$, $60°$, $30°$, $30°$
12 $45°$
13 $55°$
14 $40°$

09. 원주각의 크기와 호의 길이 (본문 125쪽)

01 $40°$
02 $30°$
03 $45°$
04 $40°$
05 $30°$
06 $45°$
07 $20°$, $40°$
08 $39°$
09 $42°$
10 $40°$
11 $60°$
12 $75°$
13 $40°$
14 $50°$
15 $20°$, 2, $40°$, 6, $120°$
16 $\angle A=60°$, $\angle B=100°$, $\angle C=20°$
17 $\angle A=60°$, $\angle B=75°$, $\angle C=45°$
18 $\angle A=60°$, $\angle B=40°$, $\angle C=80°$
19 $\angle A=45°$, $\angle B=30°$, $\angle C=105°$
20 $\angle A=60°$, $\angle B=72°$, $\angle C=48°$

10. 네 점이 한 원 위에 있을 조건 – 원주각 (본문 128쪽)

01 ×
02 ○
03 ×
04 ○
05 ×
06 ○
07 ×
08 ○
09 $55°$
10 $30°$
11 $80°$, $80°$
12 $30°$
13 $35°$, $35°$, $75°$
14 $115°$
15 $55°$, $180°$, $95°$

16 $25°$

11. 원에 내접하는 사각형의 성질 (본문 130쪽)

01 $180°, 105°, 95°, 75°$
02 $\angle x=100°, \angle y=70°$
03 $\angle x=110°, \angle y=65°$
04 $105°, 75°$
05 $\angle x=95°, \angle y=85°$
06 $\angle x=70°, \angle y=110°$
07 $110°$
08 $120°$
09 $85°$
10 $105°$
11 $100°, 45°$
12 $60°$
13 $40°$
14 $75°$

12. 사각형이 원에 내접하기 위한 조건 (본문 132쪽)

01 ○
02 ×
03 ○
04 ○
05 ×
06 ○
07 $55°, 125°$
08 $100°$
09 $65°$
10 $55°$
11 $180°, 85°$
12 $100°$
13 $60°$
14 $50°$

13. 접선과 현이 이루는 각 (본문 134쪽)

01 $75°$
02 $40°$
03 $80°$
04 $65°, 75°$
05 $105°$
06 $60°$
07 $75°, 75°, 150°$
08 $90°$
09 $80°$
10 $120°$
11 $156°$
12 $90°$
13 $140°$
14 $60°$
15 $90°, 30°, 30°$
16 $42°$
17 $26°$
18 $90°, 65°, 25°, 25°, 40°$
19 $26°$
20 $30°$

14. 두 원에서 접선과 현이 이루는 각 (본문 137쪽)

01 $50°$
02 $58°$
03 $60°$
04 $68°$
05 $58°$
06 $55°$

15. 원에서의 비례 관계 (본문 138쪽)

01 3, 2, 6
02 4
03 4
04 2
05 14
06 2
07 4, 4, 2
08 10
09 4
10 6
11 8
12 10
13 12
14 14
15 10, 5, 12
16 9
17 12
18 10
19 2, 4, 8
20 9
21 4
22 3

16. 네 점이 한 원 위에 있을 조건 – 비례 관계 (본문 141쪽)

01 ○
02 ×
03 ○
04 ○
05 ×
06 ○
07 6, 12
08 8
09 14
10 2
11 3, 11
12 2
13 5
14 14

17. 두 원에서의 비례 관계 (본문 143쪽)

01 8, 4, 6
02 5
03 6
04 2, 1, 8
05 6
06 8
07 $4, 5, \frac{17}{2}$
08 9
09 12
10 17
11 2, 2, 10, 3, 2, 5
12 $x=16, y=9$
13 $x=13, y=8$

18. 할선과 접선의 관계 (본문 145쪽)

01 16, 4
02 6
03 12
04 12
05 9
06 4
07 2, 16
08 15
09 2, 6
10 8
11 3
12 5
13 3
14 8
15 5, 5
16 $\frac{18}{5}$
17 $\frac{8}{3}$
18 $\frac{9}{4}$
19 $\frac{3}{2}$
20 $\frac{4\sqrt{5}}{5}$

19. 두 원의 할선과 접선의 관계 (본문 148쪽)

01 4
02 6
03 20
04 3
05 7
06 15
07 $6^2, 3$
08 4
09 4
10 7
11 6
12 3
13 8
14 16
15 2, 7
16 3
17 2
18 6
19 6
20 5
21 6
22 7

20. 할선과 접선의 응용 (1)

(본문 151쪽)

01 ×
02 ○
03 ×
04 ×
05 ○
06 ○
07 ○
08 3, 6
09 4
10 4
11 $2\sqrt{3}$
12 $3\sqrt{5}$
13 6
14 $4\sqrt{3}$
15 $4\sqrt{6}$
16 $3\sqrt{3}$
17 ○
18 ×
19 ×
20 ○
21 ○
22 ○
23 ○
24 $\overline{AQ}$, 1, 5
25 4
26 6
27 5, 3, 12
28 6
29 6
30 11
31 9
32 6

21. 할선과 접선의 응용 (2)

(본문 155쪽)

01 4, 2, 6
02 5
03 $\frac{24}{5}$
04 1
05 $\frac{9}{4}$
06 6, 4, 12
07 9
08 8
09 10
10 16

친절한 해설

Ⅰ. 대푯값과 산포도

01. 중앙값 (본문 8쪽)

08 크기순으로 나열하면 39, 43, 45, 56, 67이므로 중앙에 오는 중앙값은 45 kg이다.

10 크기순으로 나열하면 5, 7, 8, 10, 12, 15이므로 중앙값은 $\frac{8+10}{2}=9$

11 크기순으로 나열하면 4, 4, 5, 7, 7, 8이므로 중앙값은 $\frac{5+7}{2}=6$

12 크기순으로 나열하면 2, 4, 4, 6, 9, 10이므로 중앙값은 $\frac{4+6}{2}=5$

13 크기순으로 나열하면 17, 31, 34, 36, 36, 37이므로 중앙값은 $\frac{34+36}{2}=35$

15 $\frac{x+27}{2}=23$ $\quad\therefore x=19$

16 $\frac{21+x}{2}=22$ $\quad\therefore x=23$

17 $\frac{x+72}{2}=71$ $\quad\therefore x=70$

02. 최빈값 (본문 10쪽)

06 도수가 가장 큰 값은 2와 4이므로 최빈값은 2, 4이다.

07 도수가 가장 큰 값은 1과 8이므로 최빈값은 1, 8이다.

08 자료의 도수가 모두 같으면 최빈값은 없다.

03. 평균 (본문 11쪽)

02 $\frac{10+20+70+80}{4}=\frac{180}{4}=45$

03 $\frac{1+4+8+10+11+14}{6}=\frac{48}{6}=8$

04 $\frac{20+30+40+50+60+70+80}{7}$
$=\frac{350}{7}=50$

05 $\frac{4+8+3+5+4+7+4}{7}=\frac{35}{7}=5$

06 $\frac{4+8+5+5+3+5+8+10}{8}$
$=\frac{48}{8}=6$

07 $\frac{5+6+7+5+10+6+1+2+3+5}{10}$
$=\frac{50}{10}=5$

09 $\frac{50+40+80+x}{4}=65$이므로
$170+x=260$ $\quad\therefore x=90$

10 $\frac{8+6+2+x+5}{5}=5$이므로
$21+x=25$ $\quad\therefore x=4$

11 $\frac{64+x+57+53+66}{5}=60$이므로
$240+x=300$ $\quad\therefore x=60$

12 $\frac{23+26+32+x+29}{5}=28$이므로
$110+x=140$ $\quad\therefore x=30$

13 $\frac{35+x+25+34+29}{5}=30$이므로
$123+x=150$ $\quad\therefore x=27$

14 $\frac{x+5+4+1+3+2}{6}=4$이므로
$15+x=24$ $\quad\therefore x=9$

15 $\frac{9+2+8+x+9+4+8+7}{8}=6$
이므로
$47+x=48$ $\quad\therefore x=1$

17 a, b의 평균이 5이므로
$\frac{a+b}{2}=5$ $\quad\therefore a+b=10$
따라서 8, a, 6, b의 평균은
$\frac{8+a+6+b}{4}=\frac{10+14}{4}=6$

19 x, y, z의 평균이 6이므로
$\frac{x+y+z}{3}=6$ $\quad\therefore x+y+z=18$
따라서 8, x, y, z, 2의 평균은
$\frac{8+x+y+z+2}{5}=\frac{10+18}{5}=5.6$

20 x, y, z의 평균이 6이므로
$\frac{x+y+z}{3}=6$ $\quad\therefore x+y+z=18$
따라서 x, y, z, 9, 7, 8의 평균은
$\frac{x+y+z+9+7+8}{6}=\frac{18+24}{6}=7$

21 x, y, z의 평균이 6이므로
$\frac{x+y+z}{3}=6$ $\quad\therefore x+y+z=18$
따라서 $3x+3$, $3y+2$, $3z+1$의 평균은
$\frac{3(x+y+z+2)}{3}=x+y+z+2$
$=20$

04. 편차 (본문 14쪽)

09 (평균)$=\frac{15+65+80+40}{4}=\frac{200}{4}$
$=50$이므로
$a=15-50=-35$

10 (평균)$=\frac{8+4+1+7+5}{5}=\frac{25}{5}=5$
이므로
$a=1-5=-4$

11 (평균)$=\frac{25+16+35+64+10}{5}$
$=\frac{150}{5}=30$이므로
$a=64-30=34$

13 (평균)$=\frac{12+15+17+18+13}{5}$
$=\frac{75}{5}=15$이므로
(편차)=(변량)−(평균)임을 이용하면
-3, 0, 2, 3, -2

14 (평균)$=\frac{35+46+44+25+50}{5}$
$=\frac{200}{5}=40$이므로
(편차)=(변량)−(평균)임을 이용하면
-5, 6, 4, -15, 10

15 (평균)$=\frac{26+48+32+24+35+15}{6}$
$=\frac{180}{6}=30$이므로
(편차)=(변량)−(평균)임을 이용하면
-4, 18, 2, -6, 5, -15

17 $1+2+a+3=0$
$\therefore a=-6$

18 $a-5+2-3=0$
$\therefore a=6$

19 $-3+20-12+a=0$
$\therefore a=-5$

20 $-3+5+a+2-4=0$
$\therefore a=0$

21 $3+a-2+5-1=0$
$\therefore a=-5$

22 $-3+7-6+4+a+2=0$
$\therefore a=-4$

23 $a-20+10+9-7+5=0$
$\therefore a=3$

05. 분산과 표준편차 (본문 17쪽)

02 (1) $2^2+0^2+2^2+(-4)^2=24$

(2) (분산)$=\frac{24}{4}=6$

(3) (표준편차)$=\sqrt{6}$

03 (1) $6^2+(-1)^2+(-3)^2+0^2+(-2)^2$
$=50$

(2) (분산)$=\frac{50}{5}\frac{50}{5}=10$

(3) (표준편차)$=\sqrt{10}$

04 (1) $4^2+(-2)^2+(-2)^2+(-4)^2$
$+2^2+2^2=48$

(2) (분산)$=\frac{48}{6}=8$

(3) (표준편차)$=\sqrt{8}=2\sqrt{2}$

06 (1) $-2+0+a+4=0$
$\therefore a=-2$

(2) $(-2)^2+0^2+(-2)^2+4^2=24$

(3) (분산)$=\frac{24}{4}=6$

(4) (표준편차)$=\sqrt{6}$

07 (1) $5+a-3+1-2=0$
$\therefore a=-1$

(2) $5^2+(-1)^2+(-3)^2+1^2+(-2)^2$
$=40$

(3) (분산)$=\frac{40}{5}=8$

(4) (표준편차)$=\sqrt{8}=2\sqrt{2}$

08 (1) $2-4-1-2+a+4=0$
$\therefore a=1$

(2) $2^2+(-4)^2+(-1)^2+(-2)^2$
$+1^2+4^2=42$

(3) (분산)$=\frac{42}{6}=7$

(4) (표준편차)$=\sqrt{7}$

10 (1) (평균)$=\frac{12+13+15+16+19}{5}$
$=\frac{75}{5}=15$

(2) (분산)$=\frac{1}{5}\{(12-15)^2$
$+(13-15)^2+(15-15)^2$
$+(16-15)^2+(19-15)^2\}$
$=\frac{30}{5}=6$

(3) (표준편차)$=\sqrt{6}$

11 (1) (평균)$=\frac{27+33+29+31+20}{5}$
$=\frac{140}{5}=28$

(2) (분산)$=\frac{1}{5}\{(27-28)^2$
$+(33-28)^2+(29-28)^2$
$+(31-28)^2+(20-28)^2\}$
$=\frac{100}{5}=20$

(3) (표준편차)$=\sqrt{20}=2\sqrt{5}$

12 (1) (평균)
$=\frac{7+8+9+10+11+12+13}{7}$
$=\frac{70}{7}=10$

(2) (분산)$=\frac{1}{7}\{(7-10)^2+(8-10)^2$
$+(9-10)^2+(10-10)^2$
$+(11-10)^2+(12-10)^2$
$+(13-10)^2\}$
$=\frac{27}{7}=4$

(3) (표준편차)$=\sqrt{4}=2$

14 평균이 12이므로
$\frac{9+15+x+13+11}{5}=\frac{x+48}{5}=12$
$\therefore x=12$
(분산)$=\frac{1}{5}\{(9-12)^2+(15-12)^2$
$+(12-12)^2+(13-12)^2$
$+(11-12)^2\}$
$=\frac{20}{5}=4$

15 평균이 15이므로
$\frac{x+20+16+18+7}{5}=\frac{x+61}{5}=15$
$\therefore x=14$
(분산)$=\frac{1}{5}\{(14-15)^2+(20-15)^2$
$+(16-15)^2+(18-15)^2$
$+(7-15)^2\}$
$=\frac{100}{5}=20$

16 자료의 대푯값으로는 평균, 중앙값, 최빈값 등이 있다.

17 편차의 제곱의 평균, 즉 편차의 제곱의 합을 전체 도수로 나눈 것이 분산이다.

18 편차의 총합은 항상 0이다.

19 (편차)=(변량)−(평균)이다.

21 표준편차는 분산의 음이 아닌 제곱근이다.

22 자료의 분산 또는 표준편차가 작을수록 자료가 평균을 중심으로 몰려 있음을 뜻한다.

06. 도수분포표에서의 분산과 표준편차

(본문 21쪽)

02 (평균)$=\frac{260}{10}=26$

03 (평균)$=\frac{2260}{20}=113$

04 (평균)$=\frac{200}{40}=5$

06 (평균)$=\frac{120}{10}=12$

07 (평균)$=\frac{129}{30}=4.3$

08 (평균)$=\frac{36}{20}=1.8$

09 (평균)$=\frac{104}{20}=5.2$

10 (평균)$=\frac{206}{20}=10.3$

12 (1) 도수의 총합이 10이므로
$1+a+2+3+1=10 \quad \therefore a=3$

(2) (평균)
$=\frac{2\times1+3\times3+4\times2+5\times3+6\times1}{10}$
$=\frac{40}{10}=4$

(3) (분산)$=\frac{1}{10}\{(2-4)^2\times1$
$+(3-4)^2\times3+(4-4)^2\times2$
$+(5-4)^2\times3$
$+(6-4)^2\times1\}$
$=\frac{14}{10}=1.4$

13 (1) 도수의 총합이 10이므로
$1+2+a+2+1=10 \quad \therefore a=4$

(2) (평균)
$=\frac{2\times1+4\times2+6\times4+8\times2+10\times1}{10}$
$=\frac{60}{10}=6$

(3) (분산)$=\frac{1}{10}\{(2-6)^2\times1$
$+(4-6)^2\times2+(6-6)^2\times4$
$+(8-6)^2\times2$
$+(10-6)^2\times1\}$
$=\frac{48}{10}=4.8$

14 (1) 도수의 총합이 20이므로
$1+3+6+a+5=20 \quad \therefore a=5$

(2) (평균)
$=\frac{1\times1+3\times3+5\times6+7\times5+9\times5}{20}$
$=\frac{120}{20}=6$

(3) (분산)$=\frac{1}{20}\{(1-6)^2\times1$
$+(3-6)^2\times3+(5-6)^2\times6$
$+(7-6)^2\times5$
$+(9-6)^2\times5\}$
$=\frac{108}{20}=5.4$

15 (평균)$=\frac{420}{10}=42$,

(분산)$=\frac{2560}{10}=256$,

(표준편차)$=\sqrt{256}=16$

16 (평균)$=\frac{210}{10}=21$,

(분산)$=\frac{640}{10}=64$,

(표준편차)$=\sqrt{64}=8$

17 (평균)$=\frac{80}{20}=4$, (분산)$=\frac{60}{20}=3$,

(표준편차)$=\sqrt{3}$

18 (평균)$=\frac{1200}{20}=60$,

(분산)$=\frac{10000}{20}=500$,

(표준편차)$=\sqrt{500}=10\sqrt{5}$

19 (평균)$=\frac{1000}{20}=50$,

(분산)$=\frac{9600}{20}=480$,

(표준편차)$=\sqrt{480}=4\sqrt{30}$

20 (평균)$=\frac{2000}{20}=100$,

(분산)$=\frac{14400}{20}=720$,

(표준편차)$=\sqrt{720}=12\sqrt{5}$

Ⅱ. 피타고라스 정리

01. 피타고라스의 정리 (본문 30쪽)

02 $x^2=3^2+3^2=18$

$\therefore x=\sqrt{18}=3\sqrt{2}$

03 $x^2=12^2+5^2=169$

$\therefore x=\sqrt{169}=13$

04 $17^2=x^2+8^2$이므로 $x^2=225$

$\therefore x=\sqrt{225}=15$

05 $6^2=5^2+x^2$이므로 $x^2=11$

$\therefore x=\sqrt{11}$

06 $5^2=x^2+x^2$이므로 $x^2=\frac{25}{2}$

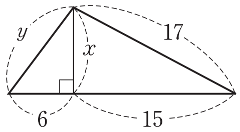
$\therefore x=\frac{5\sqrt{2}}{2}$

07 $9^2=x^2+6^2$이므로 $x^2=45$

$\therefore x=3\sqrt{5}$

$\therefore$ (넓이)$=\frac{1}{2}\times3\sqrt{5}\times6=9\sqrt{5}(\text{cm}^2)$

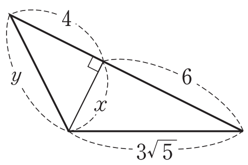
09



$x=\sqrt{17^2-15^2}=\sqrt{64}=8$

$y=\sqrt{6^2+8^2}=\sqrt{100}=10$

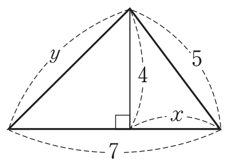
10



$x=\sqrt{(3\sqrt{5})^2-6^2}=\sqrt{9}=3$

$y=\sqrt{3^2+4^2}=\sqrt{25}=5$

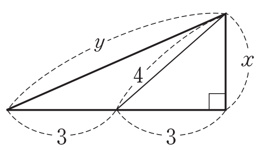
11



$x=\sqrt{5^2-4^2}=\sqrt{9}=3$

$y=\sqrt{(7-3)^2+4^2}=\sqrt{32}=4\sqrt{2}$

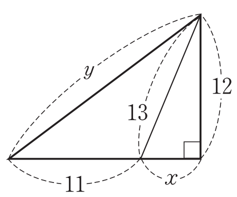
12



$x=\sqrt{4^2-3^2}=\sqrt{7}$

$y=\sqrt{6^2+(\sqrt{7})^2}=\sqrt{43}$

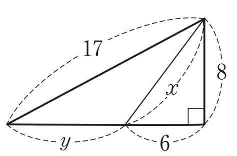
13



$x=\sqrt{13^2-12^2}=\sqrt{25}=5$

$y=\sqrt{12^2+(11+5)^2}=\sqrt{400}=20$

14



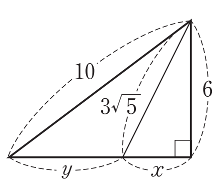
$x=\sqrt{6^2+8^2}=\sqrt{100}=10$

$(y+6)^2+8^2=17^2$이므로

$(y+6)^2=225$

$y+6=15 \qquad \therefore y=9$

15



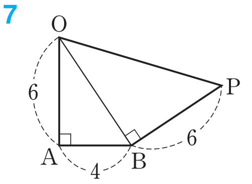
$x=\sqrt{(3\sqrt{5})^2-6^2}=\sqrt{9}=3$

$(y+3)^2+6^2=10^2$이므로

$(y+3)^2=64$

$y+3=8 \qquad \therefore y=5$

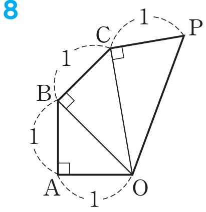
17



$\overline{OB}=\sqrt{6^2+4^2}=\sqrt{52}$

$\overline{OP}=\sqrt{(\sqrt{52})^2+6^2}=\sqrt{88}=2\sqrt{22}$

18

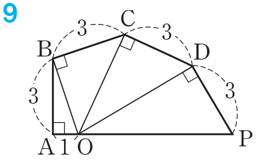


$\overline{OB}=\sqrt{1^2+1^2}=\sqrt{2}$,

$\overline{OC}=\sqrt{(\sqrt{2})^2+1^2}=\sqrt{3}$

$\overline{OP}=\sqrt{(\sqrt{3})^2+1^2}=\sqrt{4}=2$

19



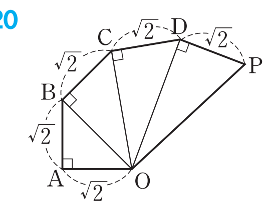
$\overline{OB}=\sqrt{1^2+3^2}=\sqrt{10}$

$\overline{OC}=\sqrt{(\sqrt{10})^2+3^2}=\sqrt{19}$

$\overline{OD}=\sqrt{(\sqrt{19})^2+3^2}=\sqrt{28}$

$\overline{OP}=\sqrt{(\sqrt{28})^2+3^2}=\sqrt{37}$

20



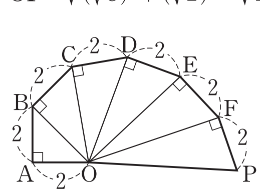
$\overline{OB}=\sqrt{(\sqrt{2})^2+(\sqrt{2})^2}=\sqrt{4}$

$\overline{OC}=\sqrt{(\sqrt{4})^2+(\sqrt{2})^2}=\sqrt{6}$

$\overline{OD}=\sqrt{(\sqrt{6})^2+(\sqrt{2})^2}=\sqrt{8}$

$\overline{OP}=\sqrt{(\sqrt{8})^2+(\sqrt{2})^2}=\sqrt{10}$

21



$\overline{OB}=\sqrt{2^2+2^2}=\sqrt{8}$

$\overline{OC}=\sqrt{(\sqrt{8})^2+2^2}=\sqrt{12}$

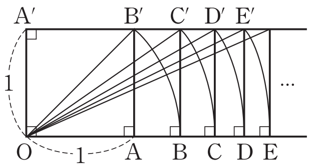
$\overline{OD}=\sqrt{(\sqrt{12})^2+2^2}=\sqrt{16}$

$\overline{OE}=\sqrt{(\sqrt{16})^2+2^2}=\sqrt{20}$

$\overline{OF}=\sqrt{(\sqrt{20})^2+2^2}=\sqrt{24}$

$\overline{OP}=\sqrt{(\sqrt{24})^2+2^2}=\sqrt{28}=2\sqrt{7}$

22



$\overline{OB}=\overline{OB'}=\sqrt{1^2+1^2}=\sqrt{2}$
$\overline{OC}=\overline{OC'}=\sqrt{(\sqrt{2})^2+1^2}=\sqrt{3}$
$\overline{OD}=\overline{OD'}=\sqrt{(\sqrt{3})^2+1^2}=\sqrt{4}$
$\overline{OE}=\overline{OE'}=\sqrt{(\sqrt{4})^2+1^2}=\sqrt{5}$

02. 피타고라스 정리의 증명 – 유클리드의 증명 (본문 33쪽)

02 □BFGC$=100-36=64(\text{cm}^2)$

03 □BFGC$=25-9=16(\text{cm}^2)$

05 □ACHI$=41-16=25(\text{cm}^2)$
$\therefore \overline{AC}=\sqrt{25}=5(\text{cm})$

06 □ACHI$=10-6=4(\text{cm}^2)$
$\therefore \overline{AC}=\sqrt{4}=2(\text{cm})$

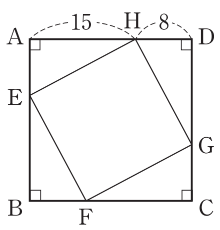
10 $\overline{AB}=\sqrt{10^2-8^2}=\sqrt{36}=6(\text{cm})$
$\therefore \triangle EBC=\triangle EBA=\frac{1}{2}$□ADEB
$=\frac{1}{2}\times 6\times 6=18(\text{cm}^2)$

11 $\triangle DML=\frac{1}{2}$□BDML
$=\frac{1}{2}\times 10^2=50(\text{cm}^2)$

12 $\overline{AC}=\sqrt{20^2-16^2}=\sqrt{144}=12(\text{cm})$
□ACHI$=12^2=144(\text{cm}^2)$
$\therefore \triangle CLG=\frac{1}{2}$□ACHI
$=\frac{1}{2}\times 144=72(\text{cm}^2)$

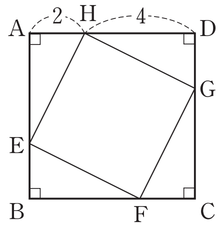
03. 피타고라스 정리의 증명 – 피타고라스의 증명 (본문 35쪽)

02



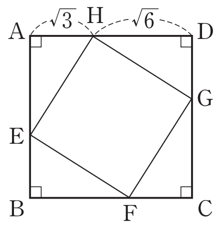
$\overline{AE}=\overline{DH}=8$이므로
$\overline{EH}=\sqrt{15^2+8^2}=17$
(□EFGH의 둘레의 길이)
$=17\times 4=68$

03



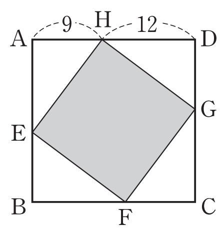
$\overline{AE}=\overline{DH}=4$이므로
$\overline{EH}=\sqrt{2^2+4^2}=2\sqrt{5}$
(□EFGH의 둘레의 길이)
$=2\sqrt{5}\times 4=8\sqrt{5}$

04



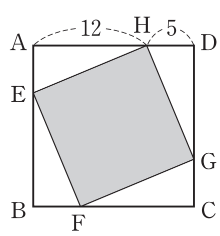
$\overline{AE}=\overline{DH}=\sqrt{6}$이므로
$\overline{EH}=\sqrt{(\sqrt{3})^2+(\sqrt{6})^2}=3$
(□EFGH의 둘레의 길이)
$=3\times 4=12$

06



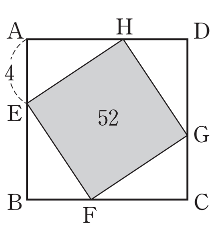
$\overline{AE}=\overline{DH}=12$이므로
$\overline{EH}=\sqrt{9^2+12^2}=15$
$\therefore$ □EFGH$=15^2=225$

07



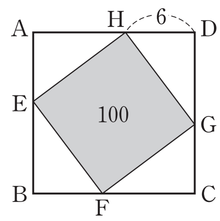
$\overline{AE}=\overline{DH}=5$이므로
$\overline{EH}=\sqrt{12^2+5^2}=13$
$\therefore$ □EFGH$=13^2=169$

09



□EFGH$=\overline{EH}^2=52$
△AEH에서
$\overline{AH}=\sqrt{52-4^2}=\sqrt{36}=6$
$\overline{AB}=4+6=10$
$\therefore$ □ABCD$=10^2=100$

10



□EFGH$=\overline{EH}^2=100$
△AEH에서
$\overline{AH}=\sqrt{100-6^2}=\sqrt{64}=8$
$\overline{AD}=6+8=14$
$\therefore$ □ABCD$=14^2=196$

04. 피타고라스 정리의 증명 – 바스카라의 증명 (본문 37쪽)

01 $\triangle ABE\equiv\triangle BCF\equiv\triangle CDG\equiv\triangle DAH$

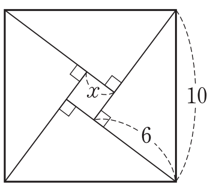
02 $\overline{CF}=\sqrt{4^2-2^2}=2\sqrt{3}$

03 $\overline{EH}=\overline{FG}=\overline{CF}-\overline{CG}=2\sqrt{3}-2$

04 $\triangle ABE=\frac{1}{2}\times 2\sqrt{3}\times 2=2\sqrt{3}$

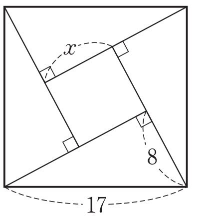
05 □EFGH$=\overline{EH}^2=(2\sqrt{3}-2)^2$
$=16-8\sqrt{3}$

07



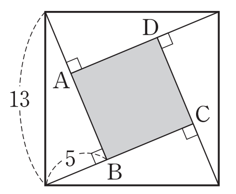
4개의 직각삼각형은 합동이므로
$x+6=\sqrt{10^2-6^2}=8$
$\therefore x=2$

08



4개의 직각삼각형은 합동이므로
$x+8=\sqrt{17^2-8^2}=15$
$\therefore x=7$

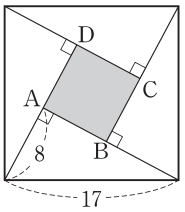
10



4개의 직각삼각형은 합동이므로
$\overline{AB}+5=\sqrt{13^2-5^2}=12$
$\therefore \overline{AB}=7$

$\therefore \square ABCD=7^2=49$

11



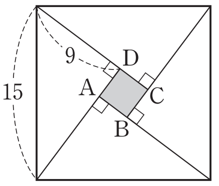
4개의 직각삼각형은 합동이므로

$\overline{AB}+8=\sqrt{17^2-8^2}=15$

$\therefore \overline{AB}=7$

$\therefore \square ABCD=7^2=49$

12



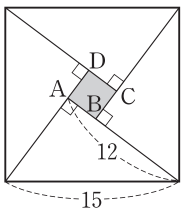
4개의 직각삼각형은 합동이므로

$\overline{AD}+9=\sqrt{15^2-9^2}=12$

$\therefore \overline{AD}=3$

$\therefore \square ABCD=3^2=9$

13



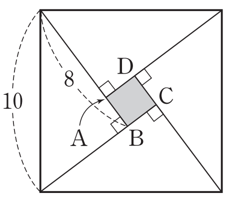
4개의 직각삼각형은 합동이므로

$12-\overline{AD}=\sqrt{15^2-12^2}=9$

$\therefore \overline{AD}=3$

$\therefore \square ABCD=3^2=9$

14



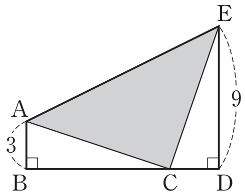
4개의 직각삼각형은 합동이므로

$8-\overline{BC}=\sqrt{10^2-8^2}=6 \qquad \therefore \overline{BC}=2$

$\therefore \square ABCD=2^2=4$

05. 피타고라스 정리의 증명 – 가필드의 증명 (본문 39쪽)

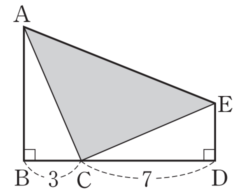
02



$\overline{AC}=\sqrt{3^2+9^2}=\sqrt{90}$

$\therefore \triangle ACE=\frac{1}{2}\times\sqrt{90}\times\sqrt{90}=45$

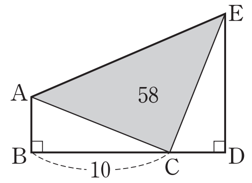
03



$\overline{AC}=\sqrt{3^2+7^2}=\sqrt{58}$

$\therefore \triangle ACE=\frac{1}{2}\times\sqrt{58}\times\sqrt{58}=29$

05



$\triangle ACE$는 직각이등변삼각형이고 넓이가 58이므로

$\frac{1}{2}\times\overline{AC}\times\overline{AC}=58$

$\therefore \overline{AC}^2=116$

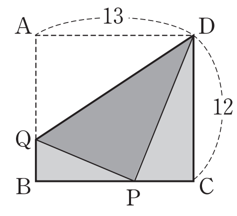
$\triangle ABC$에서 $\overline{AB}=\sqrt{116-10^2}$

$=\sqrt{16}=4$

$\therefore \square ABDE=\frac{1}{2}\times(10+4)\times14$

$=98$

07



$\overline{DP}=\overline{AD}=13$이므로 $\triangle DPC$에서

$\overline{CP}=\sqrt{13^2-12^2}=5$

$\therefore \overline{BP}=13-5=8$

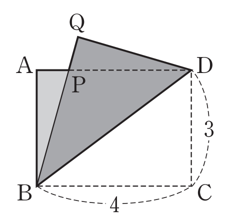
$\overline{PQ}=x$라고 하면 $\overline{AQ}=x$이므로

$\overline{BQ}=12-x$

$\triangle QBP$에서 $x^2=(12-x)^2+8^2$

$\therefore x=\frac{26}{3}$

09



$\overline{AP}=x$라고 하면 $\triangle PAB\equiv\triangle PQD$이므로

$\overline{BP}=\overline{DP}=4-x$

$\triangle ABP$에서 $(4-x)^2=x^2+3^2$

$\therefore x=\frac{7}{8}$

$\therefore \triangle ABP=\frac{1}{2}\times3\times\frac{7}{8}=\frac{21}{16}$

06. 피타고라스 정리의 역 (본문 41쪽)

02 가장 긴 변의 길이는 $3\sqrt{2}$ cm이고

$(3\sqrt{2})^2=18\neq3^2+(\sqrt{2})^2$이므로

직각삼각형이 아니다.

03 가장 긴 변의 길이는 $2\sqrt{3}$ cm이고

$(2\sqrt{3})^2=12\neq2^2+(\sqrt{5})^2$이므로

직각삼각형이 아니다.

04 가장 긴 변의 길이는 5 cm이고

$5^2=3^2+4^2$이므로 직각삼각형이다.

05 가장 긴 변의 길이는 9 cm이고

$9^2\neq4^2+6^2$이므로 직각삼각형이 아니다.

06 가장 긴 변의 길이는 13 cm이고

$13^2=5^2+12^2$이므로 직각삼각형이다.

08 $(x+1)^2=(x-1)^2+8^2$이므로

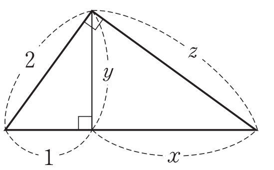
$4x=64 \qquad \therefore x=16$

09 $(x+2)^2=(x-6)^2+12^2$이므로

$16x=176 \qquad \therefore x=11$

07. 직각삼각형의 닮음을 이용한 성질 (본문 42쪽)

01

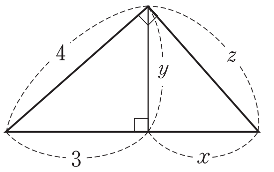


$2^2=1\times(1+x) \qquad \therefore x=3$

$y^2=1\times3 \qquad \therefore y=\sqrt{3}$

$z^2=3\times(3+1) \qquad \therefore z=2\sqrt{3}$

02

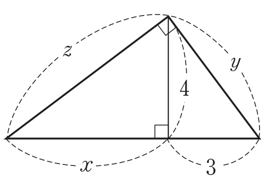


$4^2=3\times(3+x) \qquad \therefore x=\frac{7}{3}$

$y^2=3\times\frac{7}{3} \qquad \therefore y=\sqrt{7}$

$z^2=\frac{7}{3}\times\left(\frac{7}{3}+3\right) \qquad \therefore z=\frac{4\sqrt{7}}{3}$

03

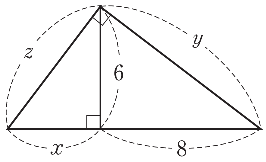


$4^2=x\times3 \qquad \therefore x=\frac{16}{3}$

$y^2=3\times\left(3+\frac{16}{3}\right) \qquad \therefore y=5$

$z^2=\frac{16}{3}\times\left(\frac{16}{3}+3\right) \qquad \therefore z=\frac{20}{3}$

04

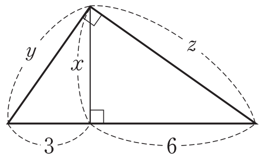


$6^2=x\times8 \quad \therefore x=\frac{9}{2}$

$y^2=8\times\left(8+\frac{9}{2}\right) \quad \therefore y=10$

$z^2=\frac{9}{2}\times\left(\frac{9}{2}+8\right) \quad \therefore z=\frac{15}{2}$

05

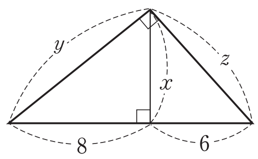


$x^2=3\times6 \quad \therefore x=3\sqrt{2}$

$y^2=3\times(3+6) \quad \therefore y=3\sqrt{3}$

$z^2=6\times(6+3) \quad \therefore z=3\sqrt{6}$

06



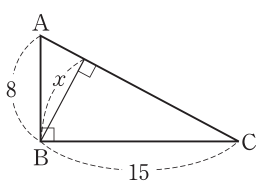
$x^2=8\times6 \quad \therefore x=4\sqrt{3}$

$y^2=8\times(8+6) \quad \therefore y=4\sqrt{7}$

$z^2=6\times(6+8) \quad \therefore z=2\sqrt{21}$

08 $6\times x=2\sqrt{5}\times4 \quad \therefore x=\frac{4\sqrt{5}}{3}$

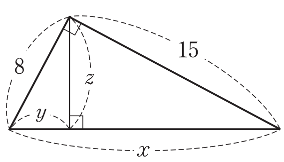
10



$\overline{AC}=\sqrt{15^2+8^2}=17$

$17\times x=15\times8 \quad \therefore x=\frac{120}{17}$

12

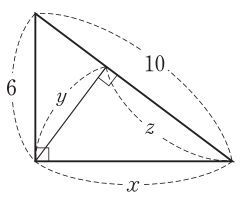


$x=\sqrt{8^2+15^2}=17$

$8^2=y\times17 \quad \therefore y=\frac{64}{17}$

$17\times z=8\times15 \quad \therefore z=\frac{120}{17}$

13

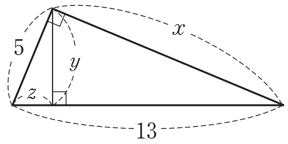


$x=\sqrt{10^2-6^2}=8$

$10\times y=8\times6 \quad \therefore y=\frac{24}{5}$

$8^2=z\times10 \quad \therefore z=\frac{32}{5}$

14



$x=\sqrt{13^2-5^2}=12$

$13\times y=5\times12 \quad \therefore y=\frac{60}{13}$

$5^2=z\times13 \quad \therefore z=\frac{25}{13}$

08. 직각삼각형 안에서 교차하는 두 선분의 성질 (본문 44쪽)

02 $\overline{BC}^2+\overline{DE}^2=14^2+9^2$

$=196+81=277$

03 $\overline{BC}^2+\overline{DE}^2=6^2+8^2$

$=36+64=100$

05 $13^2+x^2=9^2+12^2$

$x^2=56 \quad \therefore x=2\sqrt{14}$

06 $3^2+x^2=5^2+8^2$

$x^2=80 \quad \therefore x=4\sqrt{5}$

09. 두 대각선이 직교하는 사각형의 성질 (본문 45쪽)

02 $x^2+y^2=3^2+5^2=34$

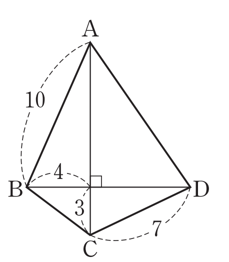
03 $x^2+y^2=6^2+8^2=100$

04 $x^2+y^2=4^2+10^2=116$

06 $x^2+6^2=5^2+4^2$이므로

$x^2=5 \quad \therefore x=\sqrt{5}$

07



$\overline{BC}=\sqrt{3^2+4^2}=\sqrt{25}=5$이므로

$10^2+7^2=5^2+\overline{AD}^2$

$\overline{AD}^2=124 \quad \therefore \overline{AD}=2\sqrt{31}$

10. 직사각형의 내부에 한 점이 있을 때 (본문 46쪽)

02 $x^2+y^2=4^2+5^2=41$

03 $x^2+y^2=5^2+2^2=29$

04 $x^2+y^2=7^2+5^2=74$

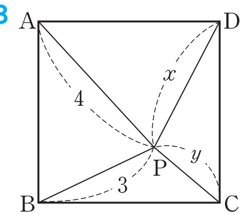
06 $4^2+x^2=5^2+3^2$이므로

$x^2=18 \quad \therefore x=3\sqrt{2}$

07 $3^2+x^2=4^2+2^2$이므로

$x^2=11 \quad \therefore x=\sqrt{11}$

08



$\overline{AP}^2+\overline{CP}^2=\overline{BP}^2+\overline{DP}^2$이므로

$4^2+y^2=3^2+x^2$

$\therefore x^2-y^2=4^2-3^2=7$

11. 직각삼각형의 세 반원 사이의 관계 (본문 47쪽)

02 (색칠한 부분의 넓이)

$=50\pi-32\pi=18\pi$

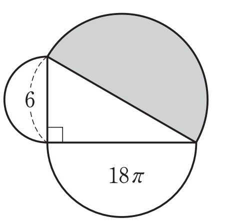
03 (색칠한 부분의 넓이)

$=24\pi+16\pi=40\pi$

04 (색칠한 부분의 넓이)

$=24\pi+8\pi=32\pi$

06



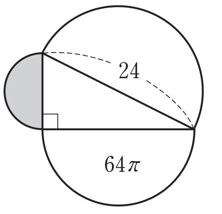
지름이 6인 반원의 넓이는

$\frac{1}{2}\times\pi\times3^2=\frac{9}{2}\pi$

$\therefore$ (색칠한 부분의 넓이)

$=\frac{9}{2}\pi+18\pi=\frac{45}{2}\pi$

07



지름이 24인 반원의 넓이는

$\frac{1}{2}\times\pi\times12^2=72\pi$

$\therefore$ (색칠한 부분의 넓이)

$=72\pi-64\pi=8\pi$

12. 히포크라테스의 원의 넓이 (본문 48쪽)

02 (색칠한 부분의 넓이)

$=9+15=24(\mathrm{cm}^2)$

03 (색칠한 부분의 넓이)

$=15-8=7(\mathrm{cm}^2)$

04 (색칠한 부분의 넓이)

$=32-13=19(\mathrm{cm}^2)$

06 $\overline{AC}=\sqrt{13^2-12^2}=\sqrt{25}=5(\mathrm{cm})$

색칠한 부분의 넓이는 △ABC의 넓이와 같으므로

$\frac{1}{2}\times12\times5=30(\mathrm{cm}^2)$

07 색칠한 부분의 넓이는 △ABC의 넓이와 같으므로

$\frac{1}{2}\times8\times\overline{AC}=60$

$\therefore \overline{AC}=15(\mathrm{cm})$

$\overline{BC}=\sqrt{8^2+15^2}=17(\mathrm{cm})$

13. 직사각형의 대각선의 길이 (본문 49쪽)

02 (대각선의 길이)$=\sqrt{10^2+5^2}$

$=5\sqrt{5}(\mathrm{cm})$

03 (대각선의 길이)$=\sqrt{5^2+12^2}$

$=13(\mathrm{cm})$

04 (대각선의 길이)$=\sqrt{10^2+8^2}$

$=2\sqrt{41}(\mathrm{cm})$

10 $x=\sqrt{(4\sqrt{3})^2-6^2}=\sqrt{12}=2\sqrt{3}$

11 $x=\sqrt{12^2-9^2}=\sqrt{63}=3\sqrt{7}$

12 $\sqrt{2}x=10 \quad \therefore x=\frac{10}{\sqrt{2}}=5\sqrt{2}$

14 $\overline{AD}=\sqrt{12^2-8^2}=\sqrt{80}=4\sqrt{5}(\mathrm{cm})$

$\therefore$ □ABCD$=8\times4\sqrt{5}=32\sqrt{5}(\mathrm{cm}^2)$

15 $\overline{CD}=\sqrt{6^2-4^2}=\sqrt{20}=2\sqrt{5}(\mathrm{cm})$

$\therefore$ □ABCD$=4\times2\sqrt{5}=8\sqrt{5}(\mathrm{cm}^2)$

16 $\sqrt{2}\times\overline{AB}=5\sqrt{2} \quad \therefore \overline{AB}=5(\mathrm{cm})$

$\therefore$ □ABCD$=5\times5=25(\mathrm{cm}^2)$

14. 정삼각형의 높이와 넓이 (본문 51쪽)

02 (높이)$=\frac{\sqrt{3}}{2}\times5=\frac{5\sqrt{3}}{2}(\mathrm{cm})$

03 (높이)$=\frac{\sqrt{3}}{2}\times8=4\sqrt{3}(\mathrm{cm})$

04 (높이)$=\frac{\sqrt{3}}{2}\times2\sqrt{3}=3(\mathrm{cm})$

06 (넓이)$=\frac{\sqrt{3}}{4}\times6^2=9\sqrt{3}(\mathrm{cm}^2)$

07 (넓이)$=\frac{\sqrt{3}}{4}\times(6\sqrt{2})^2=18\sqrt{3}(\mathrm{cm}^2)$

08 (넓이)$=\frac{\sqrt{3}}{4}\times(4\sqrt{3})^2=12\sqrt{3}(\mathrm{cm}^2)$

10 $\frac{\sqrt{3}}{2}\times x=2\sqrt{3} \quad \therefore x=4$

11 $\frac{\sqrt{3}}{4}\times x^2=16\sqrt{3}$

$x^2=64 \quad \therefore x=8$

12 $\frac{\sqrt{3}}{4}\times x^2=4\sqrt{3}$

$x^2=16 \quad \therefore x=4$

14 정삼각형의 한 변의 길이를 x라고 하면

$\frac{\sqrt{3}}{2}\times x=6 \quad \therefore x=4\sqrt{3}$

(넓이)$=\frac{\sqrt{3}}{4}\times(4\sqrt{3})^2=12\sqrt{3}$

15 정삼각형의 한 변의 길이를 x라고 하면

$\frac{\sqrt{3}}{2}\times x=\sqrt{6} \quad \therefore x=2\sqrt{2}$

(넓이)$=\frac{\sqrt{3}}{4}\times(2\sqrt{2})^2=2\sqrt{3}$

16 정삼각형의 한 변의 길이를 x라고 하면

$\frac{\sqrt{3}}{2}\times x=4\sqrt{6} \quad \therefore x=8\sqrt{2}$

(넓이)$=\frac{\sqrt{3}}{4}\times(8\sqrt{2})^2=32\sqrt{3}$

15. 이등변삼각형과 일반 삼각형의 높이와 넓이 (본문 53쪽)

02 (높이)$=\sqrt{7^2-\left(\frac{6}{2}\right)^2}$

$=\sqrt{40}=2\sqrt{10}(\mathrm{cm})$

03 (높이)$=\sqrt{10^2-\left(\frac{4}{2}\right)^2}$

$=\sqrt{96}=4\sqrt{6}(\mathrm{cm})$

05 (높이)$=\sqrt{6^2-\left(\frac{4}{2}\right)^2}$

$=\sqrt{32}=4\sqrt{2}(\mathrm{cm})$

$\therefore$ (넓이)$=\frac{1}{2}\times4\times4\sqrt{2}=8\sqrt{2}(\mathrm{cm}^2)$

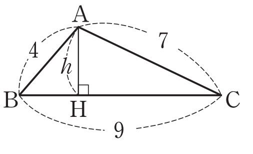
06 (높이)$=\sqrt{7^2-\left(\frac{10}{2}\right)^2}$

$=\sqrt{24}=2\sqrt{6}(\mathrm{cm})$

$\therefore$ (넓이)$=\frac{1}{2}\times10\times2\sqrt{6}$

$=10\sqrt{6}(\mathrm{cm}^2)$

07



$\overline{BH}=x$라고 하면 $\overline{CH}=9-x$

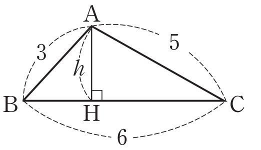
h는 두 직각삼각형 ABH, ACH의 높이이므로

$h^2=4^2-x^2=7^2-(9-x)^2$

$\therefore x=\frac{8}{3}$

$\therefore h=\sqrt{4^2-\left(\frac{8}{3}\right)^2}=\sqrt{\frac{80}{9}}=\frac{4\sqrt{5}}{3}$

08



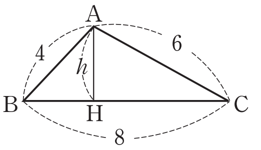
$\overline{BH}=x$라고 하면

$h^2=3^2-x^2=5^2-(6-x)^2$

$\therefore x=\frac{5}{3}$

$\therefore h=\sqrt{3^2-\left(\frac{5}{3}\right)^2}=\sqrt{\frac{56}{9}}=\frac{2\sqrt{14}}{3}$

09



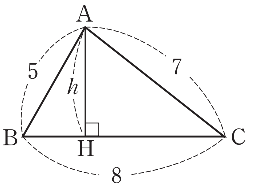
$\overline{BH}=x$라고 하면

$h^2=4^2-x^2=6^2-(8-x)^2$

$\therefore x=\frac{11}{4}$

$\therefore h=\sqrt{4^2-\left(\frac{11}{4}\right)^2}=\sqrt{\frac{135}{16}}=\frac{3\sqrt{15}}{4}$

10



$\overline{BH}=x$라고 하면

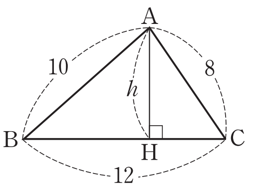
$h^2=5^2-x^2=7^2-(8-x)^2$

$\therefore x=\frac{5}{2}$

$h=\sqrt{5^2-\left(\frac{5}{2}\right)^2}=\sqrt{\frac{75}{4}}=\frac{5\sqrt{3}}{2}$이므로

$\triangle ABC=\frac{1}{2}\times8\times\frac{5\sqrt{3}}{2}=10\sqrt{3}$

11



$\overline{BH}=x$라고 하면

$h^2=10^2-x^2=8^2-(12-x)^2$

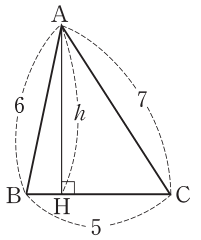
$\therefore x=\frac{15}{2}$

$h=\sqrt{10^2-\left(\frac{15}{2}\right)^2}=\sqrt{\frac{175}{4}}=\frac{5\sqrt{7}}{2}$

이므로

$\triangle ABC=\frac{1}{2}\times12\times\frac{5\sqrt{7}}{2}=15\sqrt{7}$

12



$\overline{BH}=x$라고 하면

$h^2=6^2-x^2=7^2-(5-x)^2$

$\therefore x=\frac{6}{5}$

$h=\sqrt{6^2-\left(\frac{6}{5}\right)^2}=\sqrt{\frac{864}{25}}=\frac{12\sqrt{6}}{5}$

이므로

$\triangle ABC=\frac{1}{2}\times5\times\frac{12\sqrt{6}}{5}=6\sqrt{6}$

16. 특수한 직각삼각형의 세 변의 길이의 비

(본문 55쪽)

02 $x : 4=2 : 1$이므로 $x=8$
$y : 4=\sqrt{3} : 1$이므로 $y=4\sqrt{3}$

03 $x : 3\sqrt{2}=1 : \sqrt{2}$이므로 $x=3$
$y : 3\sqrt{2}=1 : \sqrt{2}$이므로 $y=3$

04 $x : 6=1 : 2$이므로 $x=3$
$y : 6=\sqrt{3} : 2$이므로 $y=3\sqrt{3}$

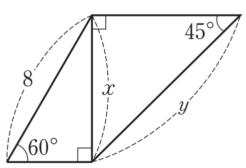
05 $x : 5=1 : 1$이므로 $x=5$
$y : 5=\sqrt{2} : 1$이므로 $y=5\sqrt{2}$

06 $x : 6\sqrt{3}=2 : \sqrt{3}$이므로 $x=12$
$y : 6\sqrt{3}=1 : \sqrt{3}$이므로 $y=6$

07 $x : 8=1 : \sqrt{2}$이므로 $x=4\sqrt{2}$
$y : 8=1 : \sqrt{2}$이므로 $y=4\sqrt{2}$

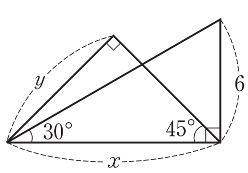
08 $x : 4=\sqrt{3} : 2$이므로 $x=2\sqrt{3}$
$y : 4=1 : 2$이므로 $y=2$

10



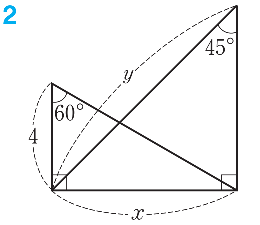
$x : 8=\sqrt{3} : 2$이므로 $x=4\sqrt{3}$
$y : 4\sqrt{3}=\sqrt{2} : 1$이므로 $y=4\sqrt{6}$

11



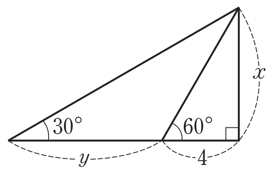
$x : 6=\sqrt{3} : 1$이므로 $x=6\sqrt{3}$
$y : 6\sqrt{3}=1 : \sqrt{2}$이므로 $y=3\sqrt{6}$

12



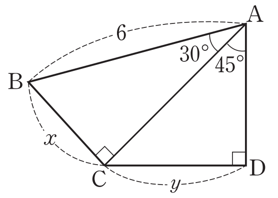
$x : 4=\sqrt{3} : 1$이므로 $x=4\sqrt{3}$
$y : 4\sqrt{3}=\sqrt{2} : 1$이므로 $y=4\sqrt{6}$

13



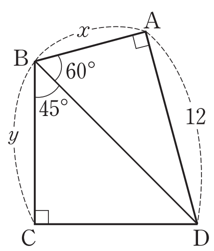
$x : 4=\sqrt{3} : 1$이므로 $x=4\sqrt{3}$
$(y+4) : 4\sqrt{3}=\sqrt{3} : 1$이므로 $y=8$

15



$x : 6=1 : 2$이므로 $x=3$
$\overline{AC} : 3=\sqrt{3} : 1$이므로 $\overline{AC}=3\sqrt{3}$
$y : 3\sqrt{3}=1 : \sqrt{2}$ $\quad\therefore y=\frac{3\sqrt{6}}{2}$

16



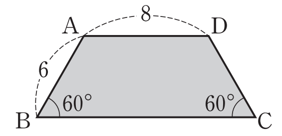
$x : 12=1 : \sqrt{3}$ $\quad\therefore x=4\sqrt{3}$
$\overline{BD} : 12=2 : \sqrt{3}$이므로 $\overline{BD}=8\sqrt{3}$
$y : 8\sqrt{3}=1 : \sqrt{2}$ $\quad\therefore y=4\sqrt{6}$

18 꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면
△ABH에서
$\overline{AH} : 6=1 : \sqrt{2}$ $\quad\therefore \overline{AH}=3\sqrt{2}$
$\therefore \square ABCD=10\times3\sqrt{2}=30\sqrt{2}$

19 꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면
△ABH에서
$\overline{AH} : 8=1 : \sqrt{2}$ $\quad\therefore \overline{AH}=4\sqrt{2}$
$\therefore \square ABCD=10\times4\sqrt{2}=40\sqrt{2}$

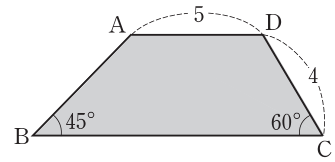
20 꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면
△ABH에서
$\overline{AH} : 10=\sqrt{3} : 2$ $\quad\therefore \overline{AH}=5\sqrt{3}$
$\therefore \square ABCD=12\times5\sqrt{3}=60\sqrt{3}$

22



꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면
△ABH에서
$\overline{AH} : 6=\sqrt{3} : 2$ $\quad\therefore \overline{AH}=3\sqrt{3}$
$\overline{BH} : 6=1 : 2$ $\quad\therefore \overline{BH}=3$
$\therefore \square ABCD$
$=\frac{1}{2}\times\{8+(3+8+3)\}\times3\sqrt{3}$
$=33\sqrt{3}$

23



꼭짓점 A와 D에서 $\overline{BC}$에 내린 수선의 발을 H, I라고 하면
△DIC에서
$\overline{DI} : 4=\sqrt{3} : 2$ $\quad\therefore \overline{DI}=2\sqrt{3}$
$\overline{IC} : 4=1 : 2$ $\quad\therefore \overline{IC}=2$
△ABH에서
$\overline{AH}=\overline{DI}=2\sqrt{3}$
$\overline{BH} : \overline{AH}=1 : 1$ $\quad\therefore \overline{BH}=2\sqrt{3}$
$\therefore \square ABCD$
$=\frac{1}{2}\times\{5+(2\sqrt{3}+5+2)\}\times2\sqrt{3}$
$=12\sqrt{3}+6$

17. 좌표평면 위의 두 점 사이의 거리

(본문 58쪽)

02 $\sqrt{2^2+4^2}=\sqrt{20}=2\sqrt{5}$

03 $\sqrt{3^2+2^2}=\sqrt{13}$

04 $\sqrt{1^2+3^2}=\sqrt{10}$

05 $\sqrt{5^2+5^2}=\sqrt{50}=5\sqrt{2}$

07 $\sqrt{\{4-(-1)\}^2+(2-0)^2}=\sqrt{29}$

08 $\sqrt{(3-2)^2+\{5-(-2)\}^2}=\sqrt{50}=5\sqrt{2}$

09 $\sqrt{\{2-(-1)\}^2+(4-1)^2}=\sqrt{18}=3\sqrt{2}$

10 $\sqrt{(3-1)^2+\{1-(-2)\}^2}=\sqrt{13}$

11 $\sqrt{(4-2)^2+\{5-(-2)\}^2}=\sqrt{53}$

13 $\overline{AB}=\sqrt{(3-0)^2+(2-2)^2}=\sqrt{9}=3$

14 $\overline{BC}=\sqrt{(3-3)^2+(5-2)^2}=\sqrt{9}=3$

15 $\overline{CA}=\sqrt{(3-0)^2+(5-2)^2}$
$=\sqrt{18}=3\sqrt{2}$

16 $\overline{CA}^2=\overline{AB}^2+\overline{BC}^2$이므로 △ABC는 직각삼각형이다.

18 $\overline{AB}=\sqrt{(4-1)^2+\{-1-(-2)\}^2}$
$=\sqrt{10}$

19 $\overline{BC}=\sqrt{(4-4)^2+\{4-(-1)\}^2}$
$=\sqrt{25}=5$

20 $\overline{CA}=\sqrt{(4-1)^2+\{4-(-2)\}^2}$
$=\sqrt{45}=3\sqrt{5}$

21 $\overline{CA}^2>\overline{AB}^2+\overline{BC}^2$이므로 $\triangle ABC$는 둔각삼각형이다.

18. 직육면체의 대각선의 길이 (본문 60쪽)

02 (대각선의 길이)$=\sqrt{2^2+2^2+4^2}$
$=2\sqrt{6}(\text{cm})$

03 (대각선의 길이)$=\sqrt{9^2+7^2+5^2}$
$=\sqrt{155}(\text{cm})$

04 (대각선의 길이)$=\sqrt{7^2+5^2+2^2}$
$=\sqrt{78}(\text{cm})$

06 (대각선의 길이)$=\sqrt{3}\times3=3\sqrt{3}(\text{cm})$

07 (대각선의 길이)$=\sqrt{3}\times9=9\sqrt{3}(\text{cm})$

08 (대각선의 길이)$=\sqrt{3}\times2\sqrt{3}=6(\text{cm})$

10 $\sqrt{x^2+3^2+4^2}=10$이므로
$x^2+25=100$
$x^2=75\quad\therefore x=5\sqrt{3}$

11 $\sqrt{6^2+4^2+x^2}=10$이므로
$52+x^2=100$
$x^2=48\quad\therefore x=4\sqrt{3}$

12 $\sqrt{4^2+x^2+10^2}=8\sqrt{3}$이므로
$116+x^2=192$
$x^2=76\quad\therefore x=2\sqrt{19}$

14 $\sqrt{3}\times x=10\sqrt{3}\quad\therefore x=10$

15 $\sqrt{3}\times x=12\quad\therefore x=4\sqrt{3}$

16 $\sqrt{3}\times x=15\quad\therefore x=5\sqrt{3}$

17 $\overline{AC}=\sqrt{6^2+6^2}=6\sqrt{2}(\text{cm})$

20 $\overline{AC}=\overline{AF}=\overline{CF}$이므로 정삼각형이다.

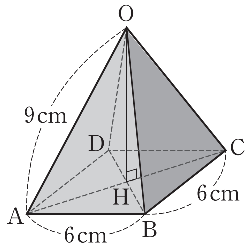
22 $\overline{BD}=\sqrt{10^2+10^2}=10\sqrt{2}(\text{cm})$

25 $\overline{BD}=\overline{BG}=\overline{DG}$이므로 정삼각형이다.

26 $\triangle BDG=\dfrac{\sqrt{3}}{4}\times(10\sqrt{2})^2$
$=50\sqrt{3}(\text{cm}^2)$

19. 정사각뿔의 높이와 부피 (본문 63쪽)

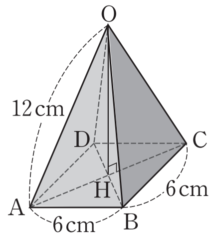
02



$\overline{AH}=\dfrac{1}{2}\times6\sqrt{2}=3\sqrt{2}(\text{cm})$

$\triangle OAH$에서
$\overline{OH}=\sqrt{9^2-(3\sqrt{2})^2}$
$=\sqrt{63}=3\sqrt{7}(\text{cm})$
따라서 정사각뿔의 부피는
$\dfrac{1}{3}\times6^2\times3\sqrt{7}=36\sqrt{7}(\text{cm}^3)$

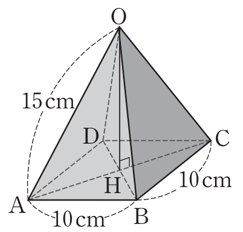
03



$\overline{AH}=\dfrac{1}{2}\times6\sqrt{2}=3\sqrt{2}(\text{cm})$

$\triangle OAH$에서
$\overline{OH}=\sqrt{12^2-(3\sqrt{2})^2}$
$=\sqrt{126}=3\sqrt{14}(\text{cm})$
따라서 정사각뿔의 부피는
$\dfrac{1}{3}\times6^2\times3\sqrt{14}=36\sqrt{14}(\text{cm}^3)$

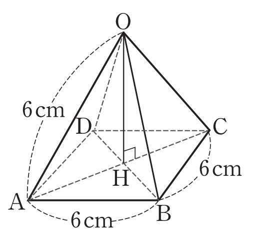
04



$\overline{AH}=\dfrac{1}{2}\times10\sqrt{2}=5\sqrt{2}(\text{cm})$

$\triangle OAH$에서
$\overline{OH}=\sqrt{15^2-(5\sqrt{2})^2}$
$=\sqrt{175}=5\sqrt{7}(\text{cm})$
따라서 정사각뿔의 부피는
$\dfrac{1}{3}\times10^2\times5\sqrt{7}=\dfrac{500\sqrt{7}}{3}(\text{cm}^3)$

05



$\overline{AH}=\dfrac{1}{2}\times6\sqrt{2}=3\sqrt{2}(\text{cm})$
$\overline{OH}=\sqrt{6^2-(3\sqrt{2})^2}=3\sqrt{2}(\text{cm})$
따라서 정사각뿔의 부피는
$\dfrac{1}{3}\times6^2\times3\sqrt{2}=36\sqrt{2}(\text{cm}^3)$

20. 정사면체의 높이와 부피 (본문 64쪽)

02 (높이)$=\dfrac{\sqrt{6}}{3}\times6=2\sqrt{6}(\text{cm})$

(부피)$=\dfrac{\sqrt{2}}{12}\times6^3=18\sqrt{2}(\text{cm}^3)$

03 (높이)$=\dfrac{\sqrt{6}}{3}\times12=4\sqrt{6}(\text{cm})$

(부피)$=\dfrac{\sqrt{2}}{12}\times12^3=144\sqrt{2}(\text{cm}^3)$

04 (높이)$=\dfrac{\sqrt{6}}{3}\times3\sqrt{2}=2\sqrt{3}(\text{cm})$

(부피)$=\dfrac{\sqrt{2}}{12}\times(3\sqrt{2})^3=9(\text{cm}^3)$

05 (높이)$=\dfrac{\sqrt{6}}{3}\times6\sqrt{6}=12(\text{cm})$

(부피)$=\dfrac{\sqrt{2}}{12}\times(6\sqrt{6})^3=216\sqrt{3}(\text{cm}^3)$

21. 원뿔의 높이와 부피 (본문 66쪽)

02 (높이)$=\sqrt{12^2-3^2}=\sqrt{135}=3\sqrt{15}(\text{cm})$

(부피)$=\dfrac{1}{3}\times\pi\times3^2\times3\sqrt{15}$
$=9\sqrt{15}\pi(\text{cm}^3)$

03 (높이)$=\sqrt{9^2-6^2}=\sqrt{45}=3\sqrt{5}(\text{cm})$

(부피)$=\dfrac{1}{3}\times\pi\times6^2\times3\sqrt{5}$
$=36\sqrt{5}\pi(\text{cm}^3)$

04 (높이)$=\sqrt{8^2-6^2}=\sqrt{28}=2\sqrt{7}(\text{cm})$

(부피)$=\dfrac{1}{3}\times\pi\times6^2\times2\sqrt{7}$
$=24\sqrt{7}\pi(\text{cm}^3)$

05 (높이)$=\sqrt{9^2-5^2}=\sqrt{56}=2\sqrt{14}(\text{cm})$

(부피)$=\dfrac{1}{3}\times\pi\times5^2\times2\sqrt{14}$
$=\dfrac{50\sqrt{14}}{3}\pi(\text{cm}^3)$

06 (높이)$=\sqrt{10^2-8^2}=\sqrt{36}=6(\text{cm})$

(부피)$=\dfrac{1}{3}\times\pi\times8^2\times6$
$=128\pi(\text{cm}^3)$

10 $2\pi\times12\times\dfrac{240^\circ}{360^\circ}=2\pi r\quad\therefore r=8$

11 (높이)$=\sqrt{12^2-8^2}=\sqrt{80}=4\sqrt{5}(\text{cm})$

12 (부피)$=\dfrac{1}{3}\times\pi\times8^2\times4\sqrt{5}$
$=\dfrac{256\sqrt{5}}{3}\pi(\text{cm}^3)$

13 $2\pi\times6\times\dfrac{x^\circ}{360^\circ}=2\pi\times2$
$\therefore x=120$

14 (높이)$=\sqrt{6^2-2^2}=\sqrt{32}=4\sqrt{2}(\text{cm})$

15 (부피)$=\dfrac{1}{3}\times\pi\times2^2\times4\sqrt{2}$
$=\dfrac{16\sqrt{2}}{3}\pi(\text{cm}^3)$

Ⅲ. 삼각비

01. 삼각비의 뜻 (본문 74쪽)

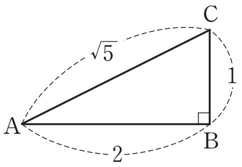
04 $\sin A=\frac{1}{\sqrt{2}}=\frac{\sqrt{2}}{2}$,

$\cos A=\frac{1}{\sqrt{2}}=\frac{\sqrt{2}}{2}$, $\tan A=1$

05 $\sin A=\frac{1}{\sqrt{5}}=\frac{\sqrt{5}}{5}$,

$\cos A=\frac{2}{\sqrt{5}}=\frac{2\sqrt{5}}{5}$, $\tan A=\frac{1}{2}$

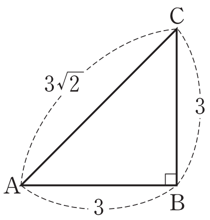
10



$\sin C=\frac{2}{\sqrt{5}}=\frac{2\sqrt{5}}{5}$,

$\cos C=\frac{1}{\sqrt{5}}=\frac{\sqrt{5}}{5}$, $\tan C=2$

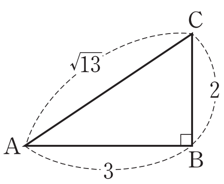
11



$\sin C=\frac{3}{3\sqrt{2}}=\frac{\sqrt{2}}{2}$,

$\cos C=\frac{3}{3\sqrt{2}}=\frac{\sqrt{2}}{2}$, $\tan C=1$

12

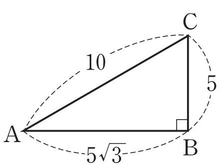


$\sin C=\frac{3}{\sqrt{13}}=\frac{3\sqrt{13}}{13}$,

$\cos C=\frac{2}{\sqrt{13}}=\frac{2\sqrt{13}}{13}$,

$\tan C=\frac{3}{2}$

13



$\sin C=\frac{5\sqrt{3}}{10}=\frac{\sqrt{3}}{2}$,

$\cos C=\frac{5}{10}=\frac{1}{2}$, $\tan C=\frac{5\sqrt{3}}{5}=\sqrt{3}$

15 $\cos A=\frac{x}{2\sqrt{2}}=\frac{\sqrt{3}}{2}$

$\therefore x=\frac{\sqrt{3}}{2}\times 2\sqrt{2}=\sqrt{6}$

16 $\tan A=\frac{x}{8}=\frac{3}{4}$

$\therefore x=\frac{3}{4}\times 8=6$

17 $\sin C=\frac{x}{6}=\frac{2}{3}$

$\therefore x=\frac{2}{3}\times 6=4$

18 $\cos C=\frac{\sqrt{3}}{x}=\frac{3}{4}$, $3x=4\sqrt{3}$

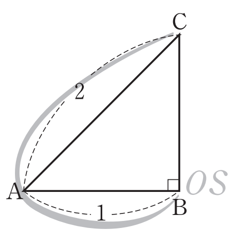
$\therefore x=\frac{4\sqrt{3}}{3}$

19 $\tan C=\frac{x}{3}=\frac{1}{2}$ $\quad\therefore x=\frac{3}{2}$

02. 한 삼각비가 주어질 때, 나머지 삼각비의 값 (본문 77쪽)

02 $\cos A=\frac{1}{2}$이므로 $\overline{AC}=2$,

$\overline{AB}=1$인 직각삼각형을 그린다.



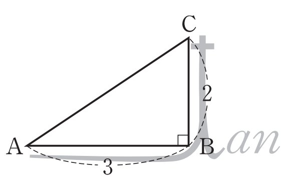
피타고라스 정리에서

$\overline{BC}=\sqrt{2^2-1^2}=\sqrt{3}$이므로

$\sin A=\frac{\sqrt{3}}{2}$, $\tan A=\sqrt{3}$

03 $\tan A=\frac{2}{3}$이므로

$\overline{AB}=3$, $\overline{BC}=2$인 직각삼각형을 그린다.



피타고라스 정리에서

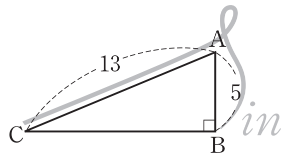
$\overline{AC}=\sqrt{3^2+2^2}=\sqrt{13}$이므로

$\sin A=\frac{2}{\sqrt{13}}=\frac{2\sqrt{13}}{13}$

$\cos A=\frac{3}{\sqrt{13}}=\frac{3\sqrt{13}}{13}$

04 $\sin C=\frac{5}{13}$이므로

$\overline{AC}=13$, $\overline{AB}=5$인 직각삼각형을 그린다.



피타고라스 정리에서

$\overline{BC}=\sqrt{13^2-5^2}=\sqrt{144}=12$이므로

$\cos C=\frac{12}{13}$, $\tan C=\frac{5}{12}$

03. 직각삼각형의 닮음을 이용한 삼각비의 값 (본문 78쪽)

02 $\triangle ABC \backsim \triangle DBA$이므로 $\angle x=\angle C$

$\therefore \cos x=\cos C=\frac{3}{5}$

03 $\tan x=\tan C=\frac{4}{3}$

04 $\triangle ABC \backsim \triangle DAC$이므로 $\angle y=\angle B$

$\therefore \sin y=\sin B=\frac{3}{5}$

05 $\cos y=\cos B=\frac{4}{5}$

06 $\tan y=\tan B=\frac{3}{4}$

07 $\overline{BC}=\sqrt{\overline{AB}^2+\overline{AC}^2}=\sqrt{3^2+4^2}=5$

08 $\triangle ABC \backsim \triangle DBA$이므로 $\angle x=\angle C$

$\therefore \sin x=\sin C=\frac{3}{5}$

09 $\triangle ABC \backsim \triangle DBA$이므로 $\angle x=\angle C$

$\therefore \cos x=\cos C=\frac{4}{5}$

10 $\triangle ABC \backsim \triangle DAC$이므로 $\angle y=\angle B$

$\therefore \sin y=\sin B=\frac{4}{5}$

11 $\triangle ABC \backsim \triangle DAC$이므로 $\angle y=\angle B$

$\therefore \cos y=\cos B=\frac{3}{5}$

12 $\triangle ABC \backsim \triangle DEC$이므로 $\angle x=\angle A$

$\therefore \sin x=\sin A=\frac{15}{17}$

13 $\cos x=\cos A=\frac{8}{17}$

14 $\triangle ABC \backsim \triangle EBD$이므로 $\angle x=\angle C$

$\therefore \sin x=\sin C=\frac{3}{\sqrt{10}}=\frac{3\sqrt{10}}{10}$

15 $\cos x=\cos C=\frac{1}{\sqrt{10}}=\frac{\sqrt{10}}{10}$

04. 직육면체에서의 삼각비 (본문 80쪽)

02 (1) $\overline{EG}=3\sqrt{2}$, $\triangle AEG$는 $\angle E=90°$인 직각삼각형이므로

$\tan x=\dfrac{3}{3\sqrt{2}}=\dfrac{\sqrt{2}}{2}$

(2) $\overline{AG}=3\sqrt{3}$이므로

$\sin x=\dfrac{3}{3\sqrt{3}}=\dfrac{\sqrt{3}}{3}$

(3) $\cos x=\dfrac{3\sqrt{2}}{3\sqrt{3}}=\dfrac{\sqrt{6}}{3}$

03 (1) $\overline{FH}=8\sqrt{2}$, $\triangle BFH$는 $\angle F=90°$인 직각삼각형이므로

$\tan x=\dfrac{8}{8\sqrt{2}}=\dfrac{\sqrt{2}}{2}$

(2) $\overline{BH}=8\sqrt{3}$이므로

$\sin x=\dfrac{8}{8\sqrt{3}}=\dfrac{\sqrt{3}}{3}$

(3) $\cos x=\dfrac{8\sqrt{2}}{8\sqrt{3}}=\dfrac{\sqrt{6}}{3}$

05. 특수각의 삼각비 (본문 81쪽)

02 $\sin 60°+\cos 30°=\dfrac{\sqrt{3}}{2}+\dfrac{\sqrt{3}}{2}=\sqrt{3}$

03 $\sin 60°-\tan 30°=\dfrac{\sqrt{3}}{2}-\dfrac{\sqrt{3}}{3}=\dfrac{\sqrt{3}}{6}$

04 $\tan 45°-\cos 60°=1-\dfrac{1}{2}=\dfrac{1}{2}$

05 $\tan 30°\times\tan 60°=\dfrac{\sqrt{3}}{3}\times\sqrt{3}=1$

06 $\sin 45°\div\cos 30°=\dfrac{\sqrt{2}}{2}\div\dfrac{\sqrt{3}}{2}$

$=\dfrac{\sqrt{2}}{2}\times\dfrac{2}{\sqrt{3}}=\dfrac{\sqrt{6}}{3}$

07 $\tan 45°\div\cos 45°=1\div\dfrac{1}{\sqrt{2}}=\sqrt{2}$

08 $\sqrt{3}\times\dfrac{1}{\tan 60°}+4\sin 30°-\sqrt{2}\cos 45°$

$=\sqrt{3}\times\dfrac{1}{\sqrt{3}}+4\times\dfrac{1}{2}-\sqrt{2}\times\dfrac{\sqrt{2}}{2}$

$=1+2-1=2$

10 $\sin 30°=\dfrac{1}{2}$이므로 $A=30°$

11 $\tan 60°=\sqrt{3}$이므로 $A=60°$

12 $\cos 60°=\dfrac{1}{2}$이므로 $A=60°$

13 $\sin 45°=\dfrac{\sqrt{2}}{2}$이므로 $A=45°$

14 $\tan 45°=1$이므로 $A=45°$

15 $\cos 30°=\dfrac{\sqrt{3}}{2}$이므로 $A=30°$

16 $\sin 60°=\dfrac{\sqrt{3}}{2}$이므로 $A=60°$

17 $\tan 30°=\dfrac{\sqrt{3}}{3}$이므로 $A=30°$

19 $\sin 30°=\dfrac{1}{2}$이므로 $\dfrac{x}{8}=\dfrac{1}{2}$

$\therefore x=4$

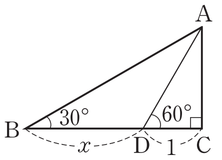
20 $\cos 60°=\dfrac{1}{2}$이므로 $\dfrac{3}{x}=\dfrac{1}{2}$

$\therefore x=6$

21 $\cos 45°=\dfrac{\sqrt{2}}{2}$이므로 $\dfrac{3\sqrt{2}}{x}=\dfrac{\sqrt{2}}{2}$

$\therefore x=6$

23



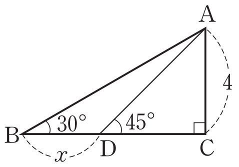
$\triangle ADC$에서 $\tan 60°=\sqrt{3}$이므로

$\dfrac{\overline{AC}}{1}=\sqrt{3}$ $\quad\therefore \overline{AC}=\sqrt{3}$

$\triangle ABC$에서 $\tan 30°=\dfrac{\sqrt{3}}{3}$이므로

$\dfrac{\sqrt{3}}{x+1}=\dfrac{\sqrt{3}}{3}$, $x+1=3$ $\quad\therefore x=2$

24



$\triangle ADC$에서 $\tan 45°=1$이므로

$\dfrac{4}{\overline{DC}}=1$ $\quad\therefore \overline{DC}=4$

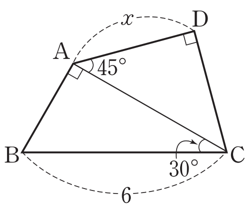
$\triangle ABC$에서 $\tan 30°=\dfrac{\sqrt{3}}{3}$이므로

$\dfrac{4}{\overline{BC}}=\dfrac{\sqrt{3}}{3}$ $\quad\therefore \overline{BC}=4\sqrt{3}$

$\therefore x=\overline{BC}-\overline{DC}=4\sqrt{3}-4$

$=4(\sqrt{3}-1)$

25



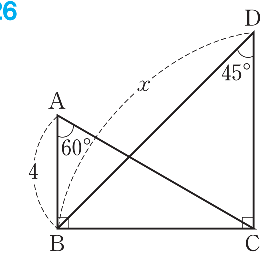
$\triangle ABC$에서 $\cos 30°=\dfrac{\sqrt{3}}{2}$이므로

$\dfrac{\overline{AC}}{6}=\dfrac{\sqrt{3}}{2}$ $\quad\therefore \overline{AC}=3\sqrt{3}$

$\triangle DAC$에서 $\cos 45°=\dfrac{\sqrt{2}}{2}$이므로

$\dfrac{x}{3\sqrt{3}}=\dfrac{\sqrt{2}}{2}$ $\quad\therefore x=\dfrac{3\sqrt{6}}{2}$

26



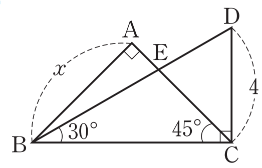
$\triangle ABC$에서 $\tan 60°=\sqrt{3}$이므로

$\dfrac{\overline{BC}}{4}=\sqrt{3}$ $\quad\therefore \overline{BC}=4\sqrt{3}$

$\triangle DBC$에서 $\sin 45°=\dfrac{\sqrt{2}}{2}$이므로

$\dfrac{4\sqrt{3}}{x}=\dfrac{\sqrt{2}}{2}$ $\quad\therefore x=4\sqrt{6}$

27



$\triangle DBC$에서 $\tan 30°=\dfrac{\sqrt{3}}{3}$이므로

$\dfrac{4}{\overline{BC}}=\dfrac{\sqrt{3}}{3}=\dfrac{1}{\sqrt{3}}$ $\quad\therefore \overline{BC}=4\sqrt{3}$

$\triangle ABC$에서 $\sin 45°=\dfrac{\sqrt{2}}{2}$이므로

$\dfrac{x}{4\sqrt{3}}=\dfrac{\sqrt{2}}{2}$ $\quad\therefore x=2\sqrt{6}$

29 기울기 $a=\tan 45°=1$

31 기울기 $a=-\tan 60°=-\sqrt{3}$

33 기울기 $a=\tan 45°=1$

y절편 $b=4$ $\quad\therefore y=x+4$

34 기울기 $a=\tan 30°=\dfrac{\sqrt{3}}{3}$

y절편 $b=1$ $\quad\therefore y=\dfrac{\sqrt{3}}{3}x+1$

06. 사분원과 임의의 예각의 삼각비 (본문 85쪽)

03 $\sin y=\dfrac{\overline{OB}}{\overline{OA}}=\overline{OB}$

07. 0°, 90°의 삼각비의 값 (본문 86쪽)

07 $\sin 90°-\cos 0°=1-1=0$

08 $2\tan 0°+\cos 90°=2\times 0+0=0$

09 $2\cos 0°-\tan 45°=2\times 1-1=1$

10 $\sin 90°\times\tan 0°+\cos 60°$

$=1\times 0+\dfrac{1}{2}=\dfrac{1}{2}$

11 $\cos 90°\times\tan 0°-\sin 90°\times\cos 0°$

$=0\times 0-1\times 1=-1$

12 $\sqrt{3}\tan 30°-\sin 90°\times\sin 60°$

$=\sqrt{3}\times\frac{1}{\sqrt{3}}-1\times\frac{\sqrt{3}}{2}=1-\frac{\sqrt{3}}{2}$

09. 삼각비의 표 (본문 88쪽)

14 $\cos 37^\circ=\frac{x}{5}=0.7986$

$\therefore x=3.993$

15 $\tan 36^\circ=\frac{x}{8}=0.7265$

$\therefore x=5.812$

16 $\sin 38^\circ=\frac{x}{12}=0.6157$

$\therefore x=7.3884$

18 $\cos A=\frac{65.61}{100}=0.6561$

$\therefore A=49^\circ$

$\sin 49^\circ=\frac{x}{100}=0.7547$

$\therefore x=75.47$

19 $\tan A=\frac{103.55}{100}=1.0355$

$\therefore A=46^\circ$

$\cos 46^\circ=\frac{100}{x}=0.6947$

$\therefore x=144$

10. 직각삼각형의 변의 길이 (본문 90쪽)

07 (1) $\sin 45^\circ=\frac{6}{x}$이므로

$x=\frac{6}{\sin 45^\circ}$ $\quad\therefore x=6\sqrt{2}$

(2) $\tan 45^\circ=\frac{6}{y}$이므로

$y=\frac{6}{\tan 45^\circ}$ $\quad\therefore y=6$

08 (1) $\sin 30^\circ=\frac{x}{8}$이므로

$x=8\sin 30^\circ$ $\quad\therefore x=4$

(2) $\cos 30^\circ=\frac{y}{8}$이므로

$y=8\cos 30^\circ$ $\quad\therefore y=4\sqrt{3}$

10 (1) $\cos 70^\circ=\frac{9}{x}$이므로

$x=\frac{9}{\cos 70^\circ}$ $\quad\therefore x=30$

(2) $\tan 70^\circ=\frac{y}{9}$이므로

$y=9\tan 70^\circ$ $\quad\therefore y=24.3$

11 (1) $\sin 31^\circ=\frac{3}{x}$이므로

$x=\frac{3}{\sin 31^\circ}$ $\quad\therefore x=6$

(2) $\tan 31^\circ=\frac{3}{y}$이므로

$y=\frac{3}{\tan 31^\circ}$ $\quad\therefore y=5$

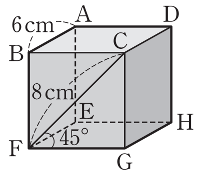
12 (1) $\cos 37^\circ=\frac{x}{10}$이므로

$x=10\cos 37^\circ$ $\quad\therefore x=8$

(2) $\sin 37^\circ=\frac{y}{10}$이므로

$y=10\sin 37^\circ$ $\quad\therefore y=6$

14



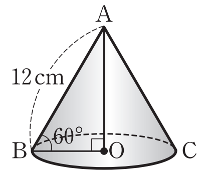
$\overline{FG}=8\cos 45^\circ=4\sqrt{2}(cm)$

$\overline{CG}=8\sin 45^\circ=4\sqrt{2}(cm)$

$\therefore$ (부피)$=4\sqrt{2}\times4\sqrt{2}\times6$

$=192(cm^3)$

15



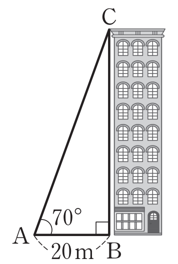
$\overline{BO}=12\cos 60^\circ=6(cm)$

$\overline{AO}=12\sin 60^\circ=6\sqrt{3}(cm)$

$\therefore$ (부피)$=\frac{1}{3}\pi\times6^2\times6\sqrt{3}$

$=72\sqrt{3}\pi(cm^3)$

17



$\tan 70^\circ=\frac{\overline{BC}}{20}$

$\therefore \overline{BC}=20\tan 70^\circ$

$=20\times2.74=54.8(m)$

11. 일반 삼각형의 변의 길이 (1) (본문 93쪽)

01 $\overline{AH}=8\sin 60^\circ=8\times\frac{\sqrt{3}}{2}=4\sqrt{3}$

02 $\overline{CH}=8\cos 60^\circ=8\times\frac{1}{2}=4$

03 $\overline{BH}=\overline{BC}-\overline{CH}=12-4=8$

04 △AHB에서

$\overline{AB}=\sqrt{(4\sqrt{3})^2+8^2}=4\sqrt{7}$

05 꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면

$\overline{AH}=6\sin 30^\circ=3$

$\overline{BH}=6\cos 30^\circ=3\sqrt{3}$

$\overline{CH}=5\sqrt{3}-3\sqrt{3}=2\sqrt{3}$이므로

$\overline{AC}=\sqrt{3^2+(2\sqrt{3})^2}=\sqrt{21}$

06 꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면

$\overline{AH}=3\sqrt{2}\sin 45^\circ=3$

$\overline{BH}=3\sqrt{2}\cos 45^\circ=3$

$\overline{CH}=7-3=4$이므로

$\overline{AC}=\sqrt{3^2+4^2}=5$

07 꼭짓점 A에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면

$\overline{AH}=8\sin 60^\circ=4\sqrt{3}$

$\overline{BH}=8\cos 60^\circ=4$

$\overline{CH}=10-4=6$이므로

$\overline{AC}=\sqrt{(4\sqrt{3})^2+6^2}=2\sqrt{21}$

12. 일반 삼각형의 변의 길이 (2) (본문 94쪽)

01 $\frac{\overline{AH}}{\overline{AC}}=\sin 45^\circ$이므로

$\overline{AH}=8\sin 45^\circ=8\times\frac{\sqrt{2}}{2}=4\sqrt{2}$

02 $\frac{\overline{AH}}{\overline{AB}}=\sin 60^\circ$이므로

$\overline{AB}=4\sqrt{2}\div\frac{\sqrt{3}}{2}=\frac{8\sqrt{6}}{3}$

04 $\overline{CH}=8\sin 30^\circ=8\times\frac{1}{2}=4$

07 $\angle A=180^\circ-(75^\circ+60^\circ)=45^\circ$

꼭짓점 B에서 $\overline{AC}$에 내린 수선의 발을 H라고 하면

$\overline{BH}=4\sin 60^\circ=4\times\frac{\sqrt{3}}{2}=2\sqrt{3}$

△ABH에서 $\frac{\overline{BH}}{x}=\sin 45^\circ$

$\therefore x=\frac{\overline{BH}}{\sin 45^\circ}=2\sqrt{3}\div\frac{\sqrt{2}}{2}=2\sqrt{6}$

08 $\angle A=180^\circ-(105^\circ+45^\circ)=30^\circ$

꼭짓점 B에서 $\overline{AC}$에 내린 수선의 발을 H라고 하면

$\overline{BH}=6\sin 45^\circ=6\times\frac{\sqrt{2}}{2}=3\sqrt{2}$

△ABH에서 $\frac{\overline{BH}}{x}=\sin 30^\circ$

$\therefore x=\frac{\overline{BH}}{\sin 30^\circ}=3\sqrt{2}\div\frac{1}{2}=6\sqrt{2}$

09 $\angle A=180^\circ-(45^\circ+75^\circ)=60^\circ$

꼭짓점 C에서 $\overline{AB}$에 내린 수선의 발을 H라고 하면

$\overline{CH}=4\sqrt{2}\sin 45^\circ=4\sqrt{2}\times\frac{1}{\sqrt{2}}=4$

△ACH에서 $\frac{\overline{CH}}{x}=\sin 60^\circ$

$\therefore x=\frac{\overline{CH}}{\sin 60^\circ}=4\div\frac{\sqrt{3}}{2}=\frac{8\sqrt{3}}{3}$

10 $\angle A=180^\circ-(30^\circ+105^\circ)=45^\circ$
꼭짓점 C에서 $\overline{AB}$에 내린 수선의 발을 H라고 하면

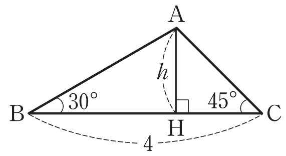
$\overline{CH}=20\sin 30^\circ=20\times\frac{1}{2}=10$

△ACH에서 $\frac{\overline{CH}}{x}=\sin 45^\circ$

$\therefore x=\frac{\overline{CH}}{\sin 45^\circ}=10\div\frac{\sqrt{2}}{2}=10\sqrt{2}$

13. 예각삼각형의 높이 (본문 96쪽)

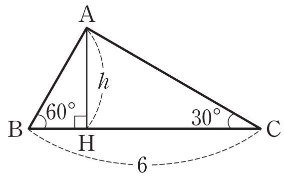
04



$\angle BAH=60^\circ$, $\angle CAH=45^\circ$이므로
$\overline{BH}=h\tan 60^\circ=\sqrt{3}h$,
$\overline{CH}=h\tan 45^\circ=h$
$\sqrt{3}h+h=4$이므로

$h=\frac{4}{\sqrt{3}+1}=2\sqrt{3}-2$

05



$\angle BAH=30^\circ$, $\angle CAH=60^\circ$이므로

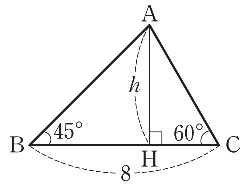
$\overline{BH}=h\tan 30^\circ=\frac{\sqrt{3}}{3}h$,

$\overline{CH}=h\tan 60^\circ=\sqrt{3}h$

$\frac{\sqrt{3}}{3}h+\sqrt{3}h=6$이므로

$h=\frac{6}{\frac{\sqrt{3}}{3}+\sqrt{3}}=\frac{3\sqrt{3}}{2}$

06



$\angle BAH=45^\circ$, $\angle CAH=30^\circ$이므로
$\overline{BH}=h\tan 45^\circ=h$,

$\overline{CH}=h\tan 30^\circ=\frac{\sqrt{3}}{3}h$

$h+\frac{\sqrt{3}}{3}h=8$이므로

$h=\frac{8}{1+\frac{\sqrt{3}}{3}}=12-4\sqrt{3}$

14. 둔각삼각형의 높이 (본문 97쪽)

05 $h=\frac{10}{\tan 45^\circ-\tan 30^\circ}=\frac{10}{1-\frac{\sqrt{3}}{3}}$

$=\frac{30}{3-\sqrt{3}}=15+5\sqrt{3}$

06 $h=\frac{8}{\tan 60^\circ-\tan 45^\circ}$

$=\frac{8}{\sqrt{3}-1}=4\sqrt{3}+4$

15. 삼각형의 넓이 (본문 98쪽)

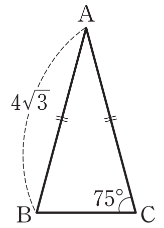
02 $\triangle ABC=\frac{1}{2}\times5\times8\times\sin 60^\circ$

$=\frac{1}{2}\times5\times8\times\frac{\sqrt{3}}{2}=10\sqrt{3}$

03 $\triangle ABC=\frac{1}{2}\times6\times4\times\sin 30^\circ$

$=\frac{1}{2}\times6\times4\times\frac{1}{2}=6$

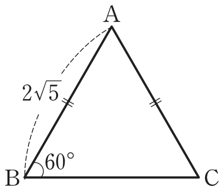
05



$\angle B=75^\circ$이므로
$\angle A=180^\circ-2\times75^\circ=30^\circ$

$\triangle ABC=\frac{1}{2}\times4\sqrt{3}\times4\sqrt{3}\times\frac{1}{2}=12$

06



$\angle B=60^\circ$이므로
$\angle A=180^\circ-2\times60^\circ=60^\circ$

$\triangle ABC=\frac{1}{2}\times2\sqrt{5}\times2\sqrt{5}\times\frac{\sqrt{3}}{2}$

$=5\sqrt{3}$

08 $\triangle ABC$

$=\frac{1}{2}\times6\times3\sqrt{2}\times\sin(180^\circ-135^\circ)$

$=\frac{1}{2}\times6\times3\sqrt{2}\times\frac{\sqrt{2}}{2}=9$

09 $\triangle ABC$

$=\frac{1}{2}\times2\sqrt{3}\times4\times\sin(180^\circ-120^\circ)$

$=\frac{1}{2}\times2\sqrt{3}\times4\times\frac{\sqrt{3}}{2}=6$

10 $\triangle ABC$

$=\frac{1}{2}\times7\times4\sqrt{3}\times\sin(180^\circ-120^\circ)$

$=\frac{1}{2}\times7\times4\sqrt{3}\times\frac{\sqrt{3}}{2}=21$

12 $\angle C=180^\circ-(25^\circ+20^\circ)=135^\circ$
이므로

$\triangle ABC=\frac{1}{2}\times4\sqrt{2}\times6\times\frac{\sqrt{2}}{2}=12$

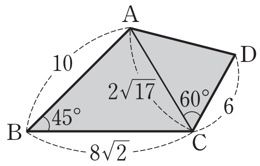
13 $\angle B=180^\circ-2\times30^\circ=120^\circ$이므로

$\triangle ABC=\frac{1}{2}\times8\times8\times\frac{\sqrt{3}}{2}=16\sqrt{3}$

14 $\angle C=180^\circ-2\times22.5^\circ=135^\circ$이므로

$\triangle ABC=\frac{1}{2}\times10\times10\times\frac{\sqrt{2}}{2}=25\sqrt{2}$

16



$\square ABCD=\triangle ABC+\triangle ACD$

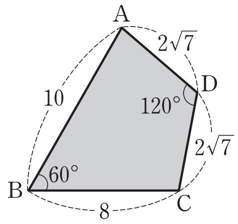
$=\frac{1}{2}\times10\times8\sqrt{2}\times\sin45^\circ$

$+\frac{1}{2}\times2\sqrt{17}\times6\times\sin60^\circ$

$=40\sqrt{2}\times\frac{\sqrt{2}}{2}+6\sqrt{17}\times\frac{\sqrt{3}}{2}$

$=40+3\sqrt{51}$

17



$\overline{AC}$를 그으면
$\square ABCD=\triangle ABC+\triangle ACD$

$=\frac{1}{2}\times10\times8\times\frac{\sqrt{3}}{2}$

$+\frac{1}{2}\times2\sqrt{7}\times2\sqrt{7}\times\frac{\sqrt{3}}{2}$

$=27\sqrt{3}$

19 $6\times\left(\frac{1}{2}\times6\times6\times\frac{\sqrt{3}}{2}\right)=54\sqrt{3}$

20 정팔각형은 8개의 합동인 삼각형으로 나누어지므로

$8\times\left(\frac{1}{2}\times5\times5\times\frac{\sqrt{2}}{2}\right)=50\sqrt{2}$

16. 사각형의 넓이 (본문 101쪽)

02 $\square ABCD=5\times4\sqrt{3}\times\frac{\sqrt{3}}{2}=30$

03 $\square ABCD=4\times6\times\frac{1}{2}=12$

04 $\square ABCD=8\times7\sqrt{2}\times\frac{\sqrt{2}}{2}=56$

05 $\square ABCD=6\times3\times\frac{1}{2}=9$

06 $\square ABCD=5\sqrt{2}\times4\times\frac{\sqrt{2}}{2}=20$

08 $\square ABCD=\frac{1}{2}\times10\times7\sqrt{2}\times\frac{\sqrt{2}}{2}=35$

09 $\square ABCD=\frac{1}{2}\times5\times6\sqrt{2}\times\frac{\sqrt{2}}{2}=15$

10 $\square ABCD=\frac{1}{2}\times6\times4\sqrt{3}\times\frac{\sqrt{3}}{2}=18$

11 $\square ABCD=\frac{1}{2}\times6\times6\times\frac{\sqrt{2}}{2}=9\sqrt{2}$

12 $\square ABCD=\frac{1}{2}\times8\sqrt{2}\times8\sqrt{2}\times1=64$

13 $\square ABCD=\frac{1}{2}\times4\times5\times1=10$

14 $\square ABCD=\frac{1}{2}\times2\sqrt{6}\times3\sqrt{6}\times1=18$

Ⅳ. 원의 성질

02. 현의 수직이등분선 (본문 110쪽)

02 $\overline{AM}=\overline{BM}=6$ cm $\quad\therefore x=6$

03 $\overline{AM}=\overline{BM}=7$ cm $\quad\therefore x=7$

04 $\overline{AM}=\overline{BM}=9$ cm $\quad\therefore x=9$

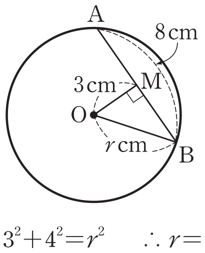
06 $\overline{AM}=\sqrt{10^2-6^2}=8$(cm)
$\therefore x=2\overline{AM}=16$

07 $\overline{BM}=\sqrt{6^2-5^2}=\sqrt{11}$(cm)
$\therefore x=2\overline{BM}=2\sqrt{11}$

08 $\overline{AM}=\sqrt{8^2-4^2}=4\sqrt{3}$(cm)
$\therefore x=2\overline{AM}=8\sqrt{3}$

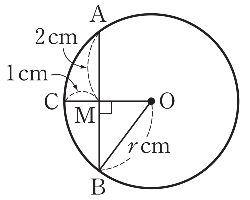
09 $5^2+4^2=r^2 \quad \therefore r=\sqrt{41}$

10



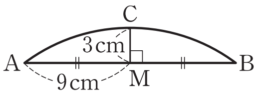
$3^2+4^2=r^2 \quad \therefore r=5$

12



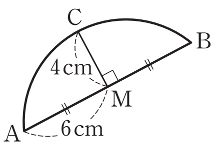
$\overline{OM}=(r-1)$cm이므로 $\triangle OMB$에서
$(r-1)^2+2^2=r^2 \quad \therefore r=\frac{5}{2}$

14



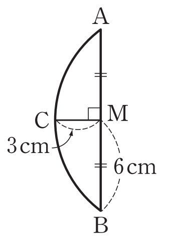
$r^2=(r-3)^2+9^2$
$6r=90 \quad \therefore r=15$

15



$r^2=(r-4)^2+6^2$
$8r=52 \quad \therefore r=\frac{13}{2}$

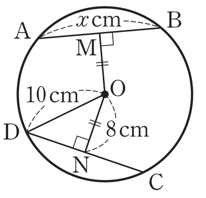
16



$r^2=(r-3)^2+6^2$
$6r=45 \quad \therefore r=\frac{15}{2}$

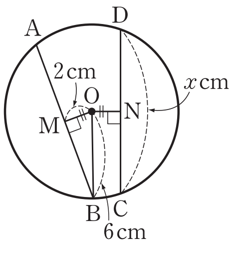
03. 현의 길이 (본문 112쪽)

08



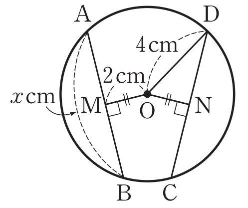
$\overline{DN}=\sqrt{10^2-8^2}=6$(cm)이므로
$x=\overline{DC}=2\overline{DN}=12$

09



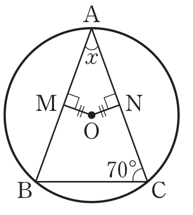
$\overline{BM}=\sqrt{6^2-2^2}=4\sqrt{2}$(cm)이므로
$x=\overline{AB}=2\overline{BM}=8\sqrt{2}$

10



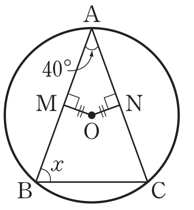
$\overline{DN}=\sqrt{4^2-2^2}=2\sqrt{3}$(cm)이므로
$x=\overline{CD}=2\overline{DN}=4\sqrt{3}$

12



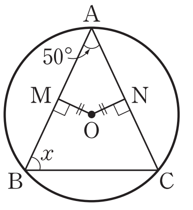
$\overline{OM}=\overline{ON}$이므로 $\overline{AB}=\overline{AC}$
$\triangle ABC$는 이등변삼각형이므로
$\angle x=180^\circ-2\times70^\circ=40^\circ$

13



$\overline{OM}=\overline{ON}$이므로 $\overline{AB}=\overline{AC}$
$\triangle ABC$는 이등변삼각형이므로
$\angle x=(180^\circ-40^\circ)\times\frac{1}{2}=70^\circ$

14



$\overline{OM}=\overline{ON}$이므로 $\overline{AB}=\overline{AC}$
$\triangle ABC$는 이등변삼각형이므로
$\angle x=(180^\circ-50^\circ)\times\frac{1}{2}=65^\circ$

04. 원의 접선의 길이 (본문 114쪽)

07 $150^\circ+\angle x=180^\circ \quad \therefore \angle x=30^\circ$

08 $60^\circ+\angle x=180^\circ \quad \therefore \angle x=120^\circ$

10 직각삼각형 OPT에서 $13^2=5^2+x^2$
$x^2=144 \quad \therefore x=12$

11 직각삼각형 OPT에서
$(7+3)^2=3^2+x^2$
$x^2=91 \quad \therefore x=\sqrt{91}$

12 직각삼각형 OPT에서 $5^2=3^2+x^2$
$x^2=16 \quad \therefore x=4$

14 $\overline{PT}=\sqrt{17^2-8^2}=15$(cm)

$\therefore \triangle OPT=\frac{1}{2}\times15\times8=60(cm^2)$

15 $\overline{PT}=\sqrt{13^2-5^2}=12(cm)$

$\therefore \triangle OPT=\frac{1}{2}\times12\times5=30(cm^2)$

16 $\overline{PT}=\sqrt{6^2-4^2}=2\sqrt{5}(cm)$

$\therefore \triangle OPT=\frac{1}{2}\times2\sqrt{5}\times4$

$=4\sqrt{5}(cm^2)$

05. 삼각형의 내접원 (본문 116쪽)

02 $\overline{CE}=\overline{CF}=(9-x)cm$,

$\overline{BD}=\overline{BE}=(11-x)cm$이므로

$(9-x)+(11-x)=10 \quad \therefore x=5$

03 $\overline{BD}=\overline{BE}=(8-x)cm$,

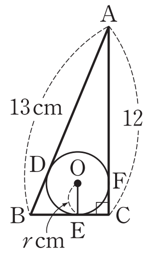
$\overline{AD}=\overline{AF}=(7-x)cm$이므로

$(8-x)+(7-x)=6 \quad \therefore x=\frac{9}{2}$

05 $x+y+z=\frac{1}{2}(6+10+14)=15$

06 $x+y+z=\frac{1}{2}(8+10+12)=15$

08



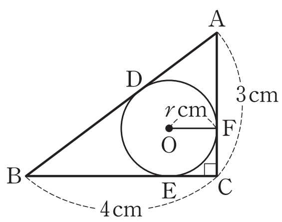
$\overline{BC}=\sqrt{13^2-12^2}=5(cm)$

$\overline{BD}=\overline{BE}=(5-r)cm$,

$\overline{AD}=\overline{AF}=(12-r)cm$

$(5-r)+(12-r)=13 \quad \therefore r=2$

09



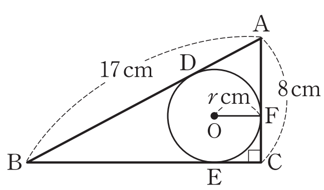
$\overline{AB}=\sqrt{4^2+3^2}=5(cm)$

$\overline{BD}=\overline{BE}=(4-r)cm$,

$\overline{AD}=\overline{AF}=(3-r)cm$

$(4-r)+(3-r)=5 \quad \therefore r=1$

10



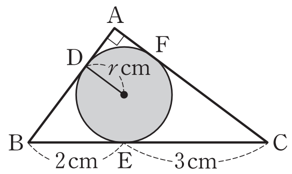
$\overline{BC}=\sqrt{17^2-8^2}=15(cm)$

$\overline{BD}=\overline{BE}=(15-r)cm$,

$\overline{AD}=\overline{AF}=(8-r)cm$

$(15-r)+(8-r)=17 \quad \therefore r=3$

12



$\overline{AB}=(2+r)cm$, $\overline{AC}=(3+r)cm$

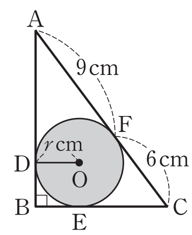
이므로

$(2+r)^2+(3+r)^2=5^2$

$r^2+5r-6=0 \quad \therefore r=1$

$\therefore$ (원 O의 넓이)$=\pi\times1^2=\pi(cm^2)$

13



$\overline{AB}=(9+r)cm$, $\overline{BC}=(6+r)cm$

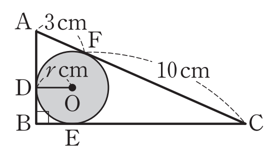
이므로

$(9+r)^2+(6+r)^2=15^2$

$r^2+15r-54=0 \quad \therefore r=3$

$\therefore$ (원 O의 넓이)$=\pi\times3^2=9\pi(cm^2)$

14



$\overline{AB}=(3+r)cm$, $\overline{BC}=(10+r)cm$

이므로

$(3+r)^2+(10+r)^2=13^2$

$r^2+13r-30=0 \quad \therefore r=2$

$\therefore$ (원 O의 넓이)$=\pi\times2^2=4\pi(cm^2)$

06. 외접사각형의 성질 (본문 118쪽)

08 $x+8=7+10 \quad \therefore x=9$

09 $9+10=11+x \quad \therefore x=8$

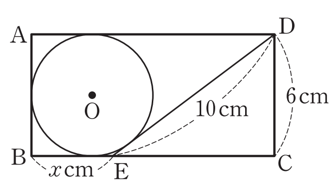
10 $9+x=6+8 \quad \therefore x=5$

12 $8+(4+x)=7+12 \quad \therefore x=7$

13 $22+10=7+(x+5) \quad \therefore x=20$

14 $8+4=5+(4+x) \quad \therefore x=3$

16

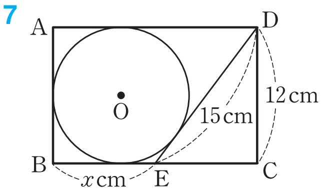


$\overline{CE}=\sqrt{10^2-6^2}=8(cm)$

$\overline{AD}=\overline{BC}=(x+8)(cm)$

$6+10=(x+8)+x \quad \therefore x=4$

17

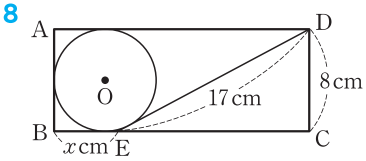


$\overline{CE}=\sqrt{15^2-12^2}=9(cm)$

$\overline{AD}=\overline{BC}=(x+9)(cm)$

$12+15=(x+9)+x \quad \therefore x=9$

18



$\overline{CE}=\sqrt{17^2-8^2}=15(cm)$

$\overline{AD}=\overline{BC}=(x+15)(cm)$

$8+17=(x+15)+x \quad \therefore x=5$

07. 원주각과 중심각의 크기 (본문 120쪽)

02 $\angle x=\frac{1}{2}\times130°=65°$

03 $\angle x=\frac{1}{2}\times80°=40°$

04 $\angle x=\frac{1}{2}\times60°=30°$

05 $\angle x=\frac{1}{2}\times100°=50°$

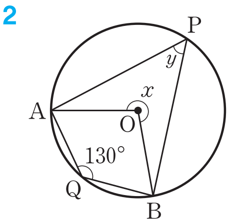
06 $\angle x=\frac{1}{2}\times84°=42°$

08 $\angle x=2\times30°=60°$

09 $\angle x=2\times45°=90°$

10 $\angle x=2\times40°=80°$

12

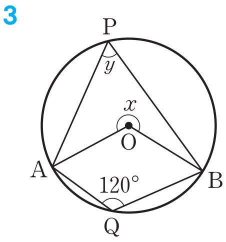


$\angle x=2\times130°=260°$

$\angle AOB=360°-260°=100°$이므로

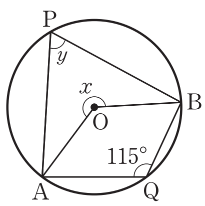
$\angle y=\frac{1}{2}\times100°=50°$

13



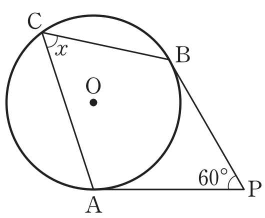
$\angle x=2\times120^\circ=240^\circ$
$\angle AOB=360^\circ-240^\circ=120^\circ$이므로
$\angle y=\frac{1}{2}\times120^\circ=60^\circ$

14



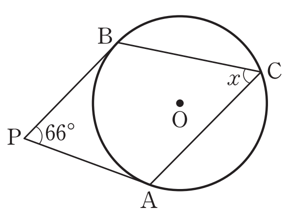
$\angle x=2\times115^\circ=230^\circ$
$\angle AOB=360^\circ-230^\circ=130^\circ$이므로
$\angle y=\frac{1}{2}\times130^\circ=65^\circ$

16



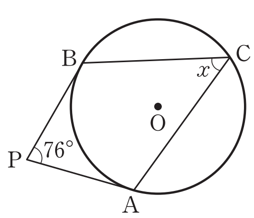
$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=120^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times120^\circ=60^\circ$

17



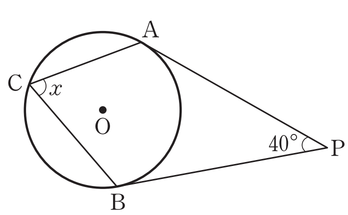
$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=114^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times114^\circ=57^\circ$

18



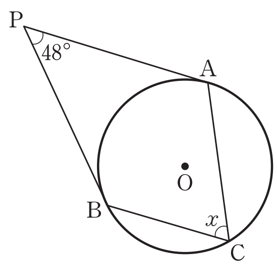
$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=104^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times104^\circ=52^\circ$

19



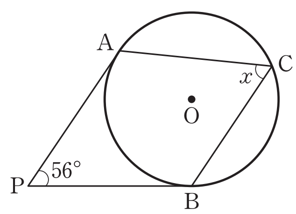
$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=140^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times140^\circ=70^\circ$

20



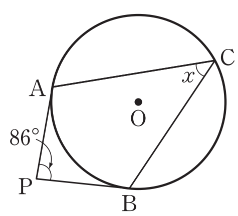
$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=132^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times132^\circ=66^\circ$

21



$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=124^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times124^\circ=62^\circ$

22



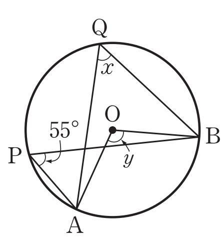
$\angle PAO=\angle PBO=90^\circ$이므로
$\angle AOB=94^\circ$
$\therefore\ \angle x=\frac{1}{2}\angle AOB=\frac{1}{2}\times94^\circ=47^\circ$

08. 원주각의 성질 (본문 123쪽)

02 $\angle x=\angle APB=50^\circ$

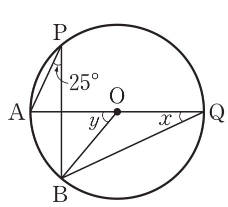
03 $\angle x=\angle AQB=55^\circ$

05



$\angle x=\angle APB=55^\circ$
$\angle y=2\times55^\circ=110^\circ$

06



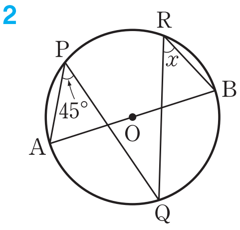
$\angle x=\angle APB=25^\circ$
$\angle y=2\times25^\circ=50^\circ$

08 $\angle APB=90^\circ$이므로
$\angle x=90^\circ-45^\circ=45^\circ$

09 $\angle APB=90^\circ$이므로
$\angle x=90^\circ-50^\circ=40^\circ$

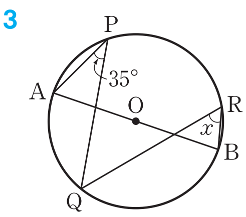
10 $\angle APB=90^\circ$이므로
$\angle x=90^\circ-70^\circ=20^\circ$

12



$\angle APB=90^\circ$이므로
$\angle QPB=90^\circ-45^\circ=45^\circ$
$\therefore\ \angle x=\angle QPB=45^\circ$

13



$\angle APB=90^\circ$이므로
$\angle QPB=90^\circ-35^\circ=55^\circ$
$\therefore\ \angle x=\angle QPB=55^\circ$

14 $\angle APB=90^\circ$이므로
$\angle QPB=90^\circ-50^\circ=40^\circ$
$\therefore\ \angle x=\angle QPB=40^\circ$

09. 원주각의 크기와 호의 길이 (본문 125쪽)

02 $\widehat{AB}=\widehat{CD}$이므로 $\angle x=\angle AQB=30^\circ$

03 $\widehat{AB}=\widehat{CD}$이므로 $\angle x=\angle APB=45^\circ$

05 $\widehat{AB}=\widehat{BC}$이므로
$\angle x=\frac{1}{2}\angle AOB=30^\circ$

06 $\widehat{AB}=\widehat{BC}$이므로
$\angle x=\frac{1}{2}\angle BOC=45^\circ$

08 $2:3=26^\circ:\angle x$ $\quad\therefore\ \angle x=39^\circ$

09 $2:3=28^\circ:\angle x$ $\quad\therefore\ \angle x=42^\circ$

10 $1:2=20^\circ:\angle x$ $\quad\therefore\ \angle x=40^\circ$

11 $1:4=15^\circ:\angle x$ $\quad\therefore\ \angle x=60^\circ$

12 $1:3=25^\circ:\angle x$ $\quad\therefore\ \angle x=75^\circ$

13 $3:2=60^\circ:\angle x$ $\quad\therefore\ \angle x=40^\circ$

14 $1:2=25^\circ:\angle x$ $\quad\therefore\ \angle x=50^\circ$

16 $\angle A=\frac{3}{1+3+5}\times180^\circ=60^\circ$

$\angle B=\dfrac{5}{1+3+5}\times180^\circ=100^\circ$

$\angle C=\dfrac{1}{1+3+5}\times180^\circ=20^\circ$

17 $\angle A=\dfrac{4}{3+4+5}\times180^\circ=60^\circ$

$\angle B=\dfrac{5}{3+4+5}\times180^\circ=75^\circ$

$\angle C=\dfrac{3}{3+4+5}\times180^\circ=45^\circ$

18 $\angle A=\dfrac{3}{4+3+2}\times180^\circ=60^\circ$

$\angle B=\dfrac{2}{4+3+2}\times180^\circ=40^\circ$

$\angle C=\dfrac{4}{4+3+2}\times180^\circ=80^\circ$

19 $\angle A=\dfrac{3}{7+3+2}\times180^\circ=45^\circ$

$\angle B=\dfrac{2}{7+3+2}\times180^\circ=30^\circ$

$\angle C=\dfrac{7}{7+3+2}\times180^\circ=105^\circ$

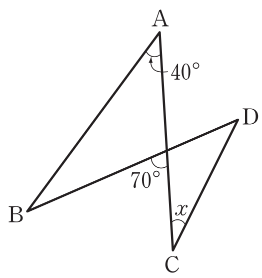
20 $\angle A=\dfrac{5}{4+5+6}\times180^\circ=60^\circ$

$\angle B=\dfrac{6}{4+5+6}\times180^\circ=72^\circ$

$\angle C=\dfrac{4}{4+5+6}\times180^\circ=48^\circ$

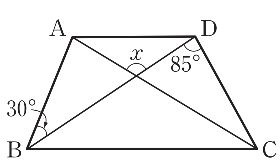
10. 네 점이 한 원 위에 있을 조건 – 원주각 (본문 128쪽)

12



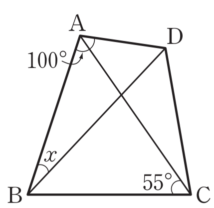
삼각형의 한 외각의 크기는 두 내각의 크기의 합과 같으므로 $\angle B=30^\circ$이다.
$\angle x=\angle B=30^\circ$

14



$\angle BAC=\angle BDC=85^\circ$
$\therefore \angle x=30^\circ+85^\circ=115^\circ$

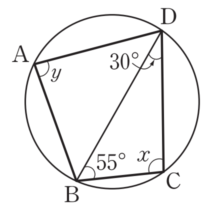
16



$\angle ADB=55^\circ$
$\angle x+100^\circ+55^\circ=180^\circ$
$\therefore \angle x=25^\circ$

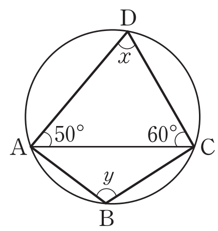
11. 원에 내접하는 사각형의 성질 (본문 130쪽)

05



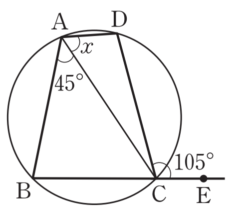
$\angle x=180^\circ-(30^\circ+55^\circ)=95^\circ$
$\angle y=180^\circ-\angle x=85^\circ$

06



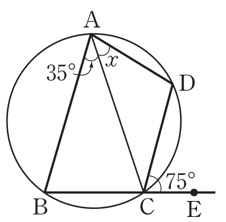
$\angle x=180^\circ-(50^\circ+60^\circ)=70^\circ$
$\angle y=180^\circ-\angle x=110^\circ$

12



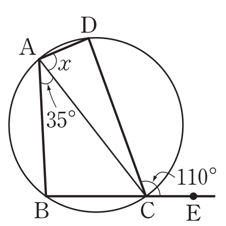
$45^\circ+\angle x=105^\circ \quad \therefore \angle x=60^\circ$

13



$35^\circ+\angle x=75^\circ \quad \therefore \angle x=40^\circ$

14



$35^\circ+\angle x=110^\circ \quad \therefore \angle x=75^\circ$

12. 사각형이 원에 내접하기 위한 조건 (본문 132쪽)

08 $\angle x=180^\circ-80^\circ=100^\circ$

09 $\angle x=180^\circ-115^\circ=65^\circ$

10 $\angle x=180^\circ-125^\circ=55^\circ$

12 $\angle A+\angle C=180^\circ$이므로 $\angle x=100^\circ$

13 $\angle B+\angle D=180^\circ$이므로 $\angle x=60^\circ$

14 $\angle B+\angle D=180^\circ$이므로 $\angle x=50^\circ$

13. 접선과 현이 이루는 각 (본문 134쪽)

02 $\angle x=\angle BAT=40^\circ$

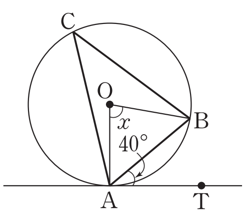
03 $\angle x=\angle CAT=80^\circ$

05 $\angle x=\angle BAT$
$=180^\circ-(45^\circ+30^\circ)=105^\circ$

06 $\angle x=\angle CAT$
$=180^\circ-(80^\circ+40^\circ)=60^\circ$

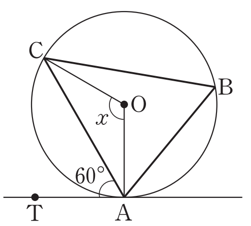
08 $\angle CBA=\angle CAT=45^\circ$이므로
$\angle x=2\angle CBA=2\times45^\circ=90^\circ$

09



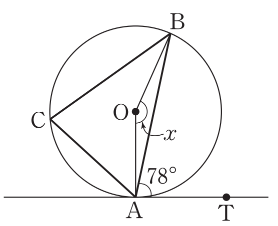
$\angle BCA=\angle BAT=40^\circ$이므로
$\angle x=2\angle BCA=2\times40^\circ=80^\circ$

10



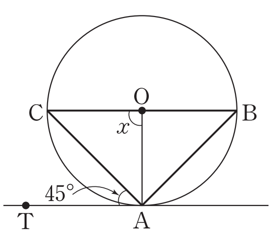
$\angle CBA=\angle CAT=60^\circ$이므로
$\angle x=2\angle CBA=2\times60^\circ=120^\circ$

11



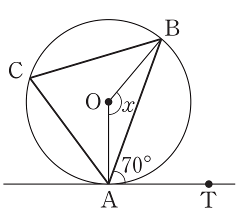
$\angle BCA=\angle BAT=78^\circ$이므로
$\angle x=2\angle BCA=2\times78^\circ=156^\circ$

12



$\angle CBA=\angle CAT=45^\circ$이므로
$\angle x=2\angle CBA=2\times45^\circ=90^\circ$

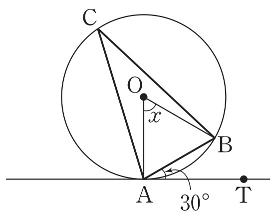
13



$\angle BCA = \angle BAT = 70^\circ$이므로

$\angle x = 2\angle BCA = 2\times 70^\circ = 140^\circ$

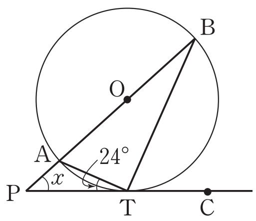
14



$\angle BCA = \angle BAT = 30^\circ$이므로

$\angle x = 2\angle BCA = 2\times 30^\circ = 60^\circ$

16



$\overline{AB}$가 원 O의 지름이므로

$\angle ATB = 90^\circ$이고

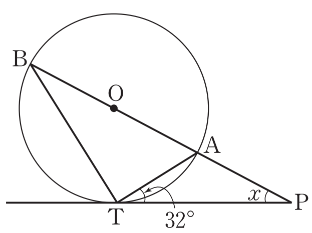
$\angle ABT = \angle ATP = 24^\circ$

$\triangle PBT$에서

$\angle x = 180^\circ - \{24^\circ + (24^\circ + 90^\circ)\}$

$= 42^\circ$

17



$\overline{AB}$가 원 O의 지름이므로

$\angle ATB = 90^\circ$이고

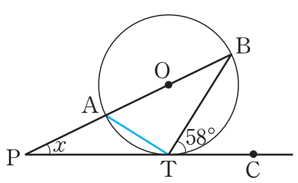
$\angle ABT = \angle ATP = 32^\circ$

$\triangle PBT$에서

$\angle x = 180^\circ - \{32^\circ + (32^\circ + 90^\circ)\}$

$= 26^\circ$

19



보조선 AT를 그으면 $\angle ATB = 90^\circ$

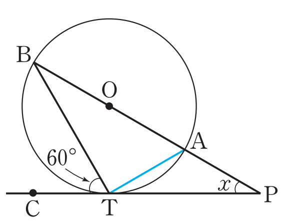
$\angle PTC = 180^\circ$이므로 $\triangle PBT$에서

$\angle PBT = \angle ATP$

$= 180^\circ - (90^\circ + 58^\circ) = 32^\circ$

$\angle x + 32^\circ = 58^\circ$이므로 $\angle x = 26^\circ$

20



보조선 AT를 그으면 $\angle ATB = 90^\circ$

$\angle CTP = 180^\circ$이므로 $\triangle PBT$에서

$\angle PBT = \angle ATP$

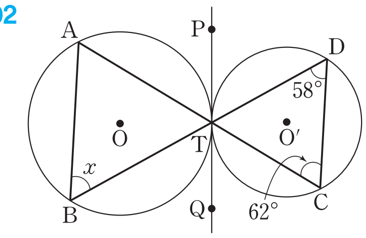
$= 180^\circ - (60^\circ + 90^\circ) = 30^\circ$

$\angle x + 30^\circ = 60^\circ$이므로 $\angle x = 30^\circ$

14. 두 원에서 접선과 현이 이루는 각

(본문 137쪽)

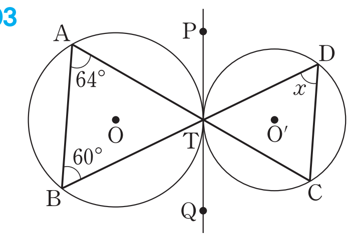
02



$\angle x = \angle ATP = \angle CTQ$

$= \angle CDT = 58^\circ$

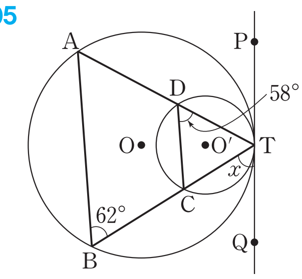
03



$\angle x = \angle CTQ = \angle ATP$

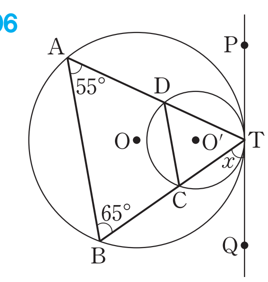
$= \angle ABT = 60^\circ$

05



$\angle x = \angle CDT = 58^\circ$

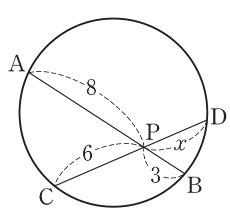
06



$\angle x = \angle BAT = 55^\circ$

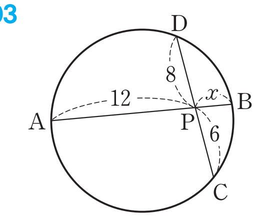
15. 원에서의 비례 관계 (본문 138쪽)

02



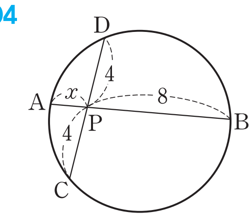
$8\times 3 = 6\times x$ $\therefore x = 4$

03



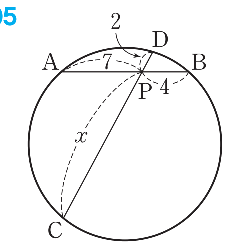
$12\times x = 8\times 6$ $\therefore x = 4$

04



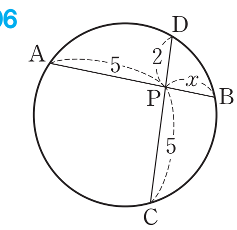
$x\times 8 = 4\times 4$ $\therefore x = 2$

05



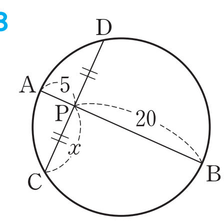
$7\times 4 = 2\times x$ $\therefore x = 14$

06



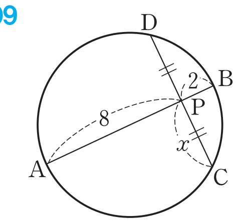
$5\times x = 2\times 5$ $\therefore x = 2$

08



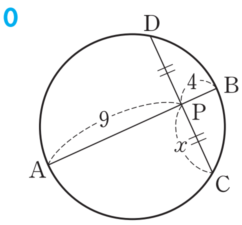
$x^2 = 5\times 20 = 100$ $\therefore x = 10$

09



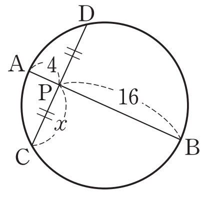
$x^2 = 8\times 2 = 16$ $\therefore x = 4$

10



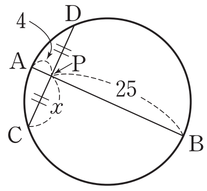
$x^2 = 9\times 4 = 36$ $\therefore x = 6$

11



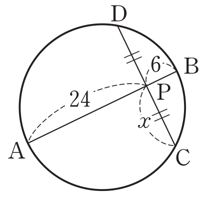
$x^2=4\times16=64 \quad \therefore x=8$

12



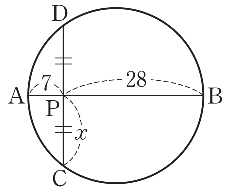
$x^2=4\times25=100 \quad \therefore x=10$

13



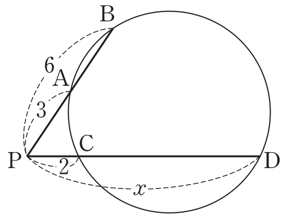
$x^2=24\times6=144 \quad \therefore x=12$

14



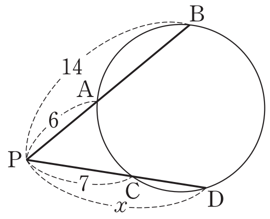
$x^2=7\times28=196 \quad \therefore x=14$

16



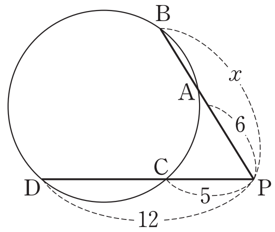
$3\times6=2\times x \quad \therefore x=9$

17



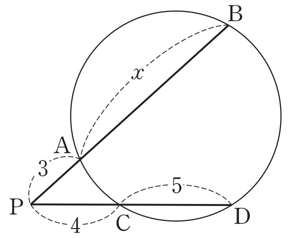
$6\times14=7\times x \quad \therefore x=12$

18



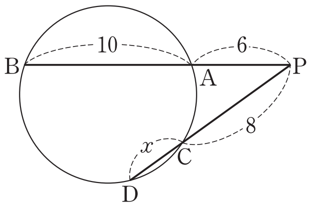
$6\times x=5\times12 \quad \therefore x=10$

20



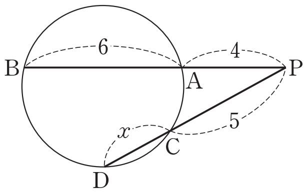
$3\times(3+x)=4\times(4+5) \quad \therefore x=9$

21



$6\times(6+10)=8\times(8+x) \quad \therefore x=4$

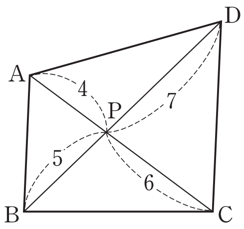
22



$4\times(4+6)=5\times(5+x) \quad \therefore x=3$

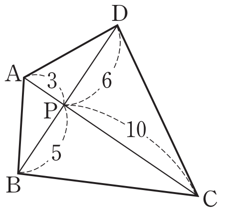
16. 네 점이 한 원 위에 있을 조건 – 비례 관계 (본문 141쪽)

02



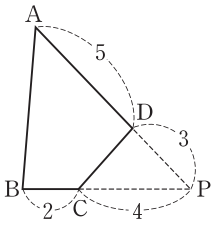
$4\times6\neq5\times7$이므로 네 점 A, B, C, D는 한 원 위에 있지 않다.

03



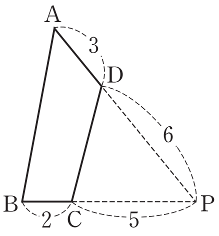
$3\times10=5\times6$이므로 네 점 A, B, C, D는 한 원 위에 있다.

04



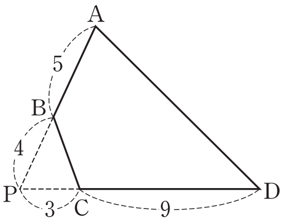
$3\times(3+5)=4\times(4+2)$이므로 네 점 A, B, C, D는 한 원 위에 있다.

05



$6\times(6+3)\neq5\times(5+2)$이므로 네 점 A, B, C, D는 한 원 위에 있지 않다.

06



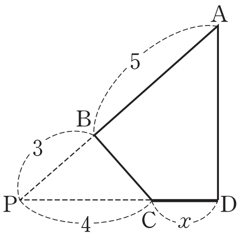
$4\times(4+5)=3\times(3+9)$이므로 네 점 A, B, C, D는 한 원 위에 있다.

08 $\overline{PA}\cdot\overline{PC}=\overline{PB}\cdot\overline{PD}$이어야 하므로
$4\times8=x\times4 \quad \therefore x=8$

09 $\overline{PA}\cdot\overline{PC}=\overline{PB}\cdot\overline{PD}$이어야 하므로
$6\times7=3\times x \quad \therefore x=14$

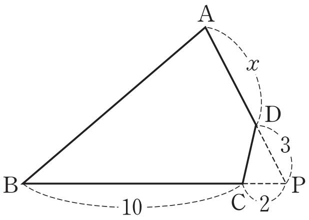
10 $\overline{PA}\cdot\overline{PC}=\overline{PB}\cdot\overline{PD}$이어야 하므로
$3\times4=x\times6 \quad \therefore x=2$

12



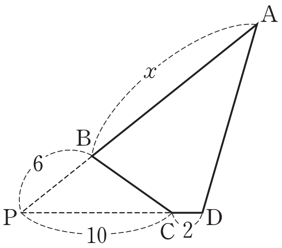
$\overline{PB}\cdot\overline{PA}=\overline{PC}\cdot\overline{PD}$이어야 하므로
$3\times(3+5)=4\times(4+x)$
$\therefore x=2$

13



$\overline{PD}\cdot\overline{PA}=\overline{PC}\cdot\overline{PB}$이어야 하므로
$3\times(3+x)=2\times(2+10)$
$\therefore x=5$

14



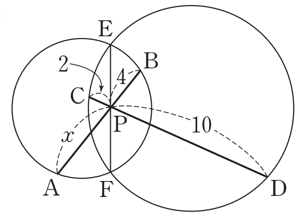
$\overline{PB}\cdot\overline{PA}=\overline{PC}\cdot\overline{PD}$이어야 하므로

$6\times(6+x)=10\times(10+2)$

$\therefore x=14$

17. 두 원에서의 비례 관계 (본문 143쪽)

02

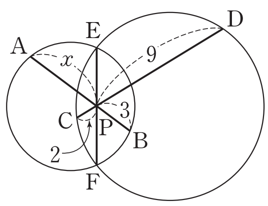


$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$x\times4=2\times10$

$\therefore x=5$

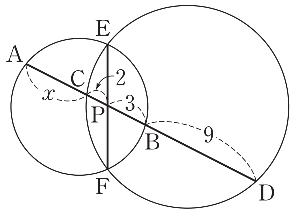
03



$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$x\times3=2\times9$ $\therefore x=6$

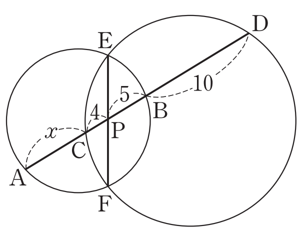
05



$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$(x+2)\times3=2\times(3+9)$ $\therefore x=6$

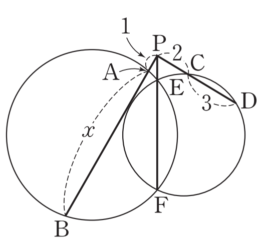
06



$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$(x+4)\times5=4\times(5+10)$ $\therefore x=8$

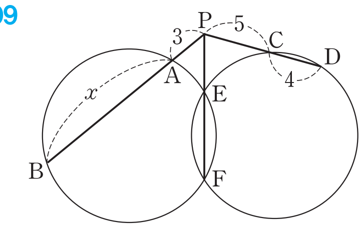
08



$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$1\times(1+x)=2\times(2+3)$ $\therefore x=9$

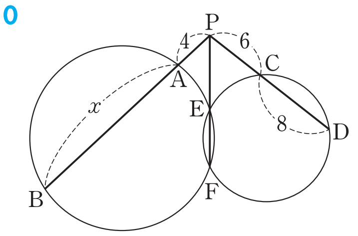
09



$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$3\times(3+x)=5\times(5+4)$ $\therefore x=12$

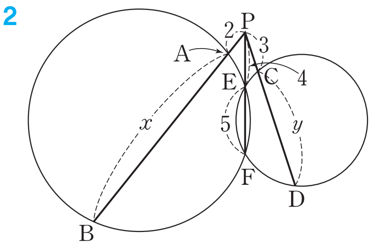
10



$\overline{PA}\cdot\overline{PB}=\overline{PC}\cdot\overline{PD}$이므로

$4\times(4+x)=6\times(6+8)$ $\therefore x=17$

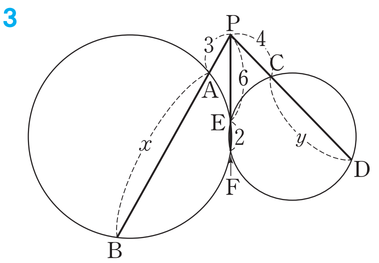
12



$2\times(2+x)=4\times(4+5)$ $\therefore x=16$

$3\times(3+y)=4\times(4+5)$ $\therefore y=9$

13

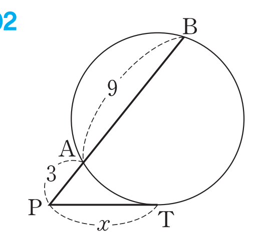


$3\times(3+x)=6\times(6+2)$ $\therefore x=13$

$4\times(4+y)=6\times(6+2)$ $\therefore y=8$

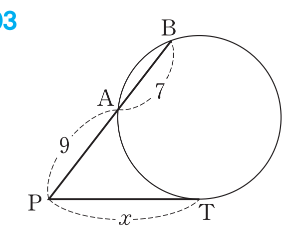
18. 할선과 접선의 관계 (본문 145쪽)

02



$x^2=3\times(3+9)$ $\therefore x=6$ ($\because x>0$)

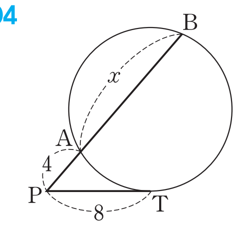
03



$x^2=9\times(9+7)$

$\therefore x=12$ ($\because x>0$)

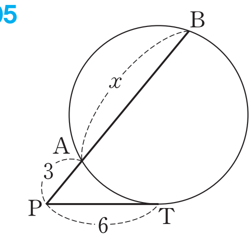
04



$8^2=4\times(4+x)$

$\therefore x=12$

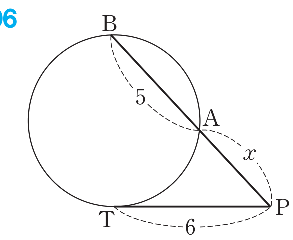
05



$6^2=3\times(3+x)$

$\therefore x=9$

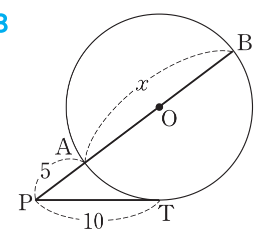
06



$6^2=x\times(x+5)$

$\therefore x=4$ ($\because x>0$)

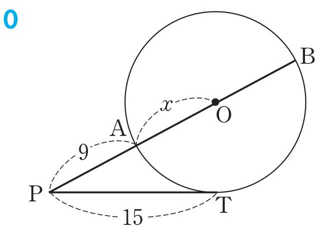
08



$10^2=5\times(5+x)$

$\therefore x=15$

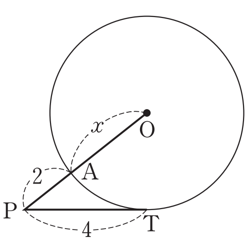
10



$15^2=9\times(9+2\times x)$

$\therefore x=8$

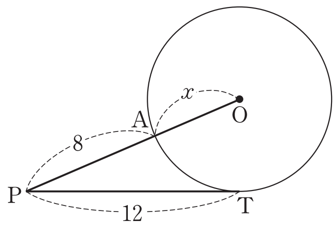
11



$4^2=2\times(2+2\times x)$

$\therefore x=3$

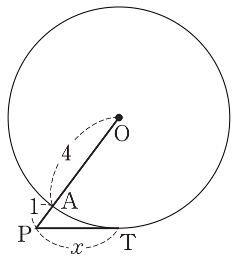
12



$12^2=8\times(8+2\times x)$

$\therefore x=5$

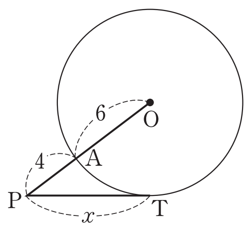
13



$x^2=1\times(1+2\times 4)$

$\therefore x=3\ (\because x>0)$

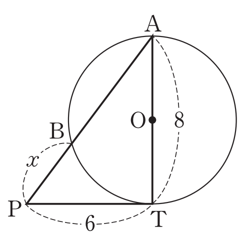
14



$x^2=4\times(4+2\times 6)$

$\therefore x=8\ (\because x>0)$

16

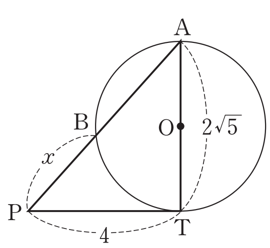


$\overline{AP}=\sqrt{6^2+8^2}=10$

$6^2=x\times 10$

$\therefore x=\frac{18}{5}$

17

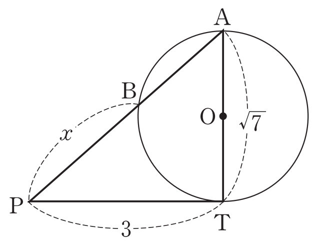


$\overline{AP}=\sqrt{4^2+(2\sqrt{5})^2}=6$

$4^2=x\times 6$

$\therefore x=\frac{8}{3}$

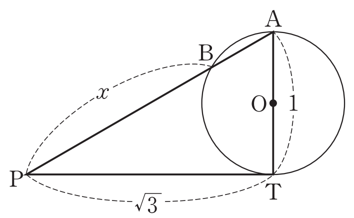
18



$\overline{AP}=\sqrt{3^2+(\sqrt{7})^2}=4$

$3^2=x\times 4 \qquad \therefore x=\frac{9}{4}$

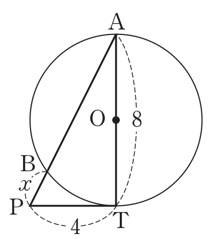
19



$\overline{AP}=\sqrt{(\sqrt{3})^2+1^2}=2$

$(\sqrt{3})^2=x\times 2 \qquad \therefore x=\frac{3}{2}$

20



$\overline{AP}=\sqrt{4^2+8^2}=4\sqrt{5}$

$4^2=x\times 4\sqrt{5} \qquad \therefore x=\frac{4\sqrt{5}}{5}$

19. 두 원의 할선과 접선의 관계 (본문 148쪽)

02 $\overline{PT}=\overline{PT'}$이므로 $x=6$

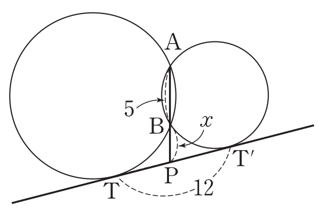
03 $\overline{PT}=\overline{PT'}$이므로 $x=20$

04 $\overline{PT}=\overline{PT'}$이므로 $x=3$

05 $\overline{PT}=\overline{PT'}$이므로 $x=7$

06 $\overline{PT}=\overline{PT'}$이므로 $x=15$

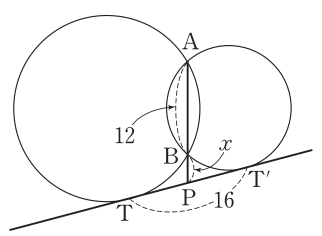
08



$6^2=x\times(x+5)$

$\therefore x=4\ (\because x>0)$

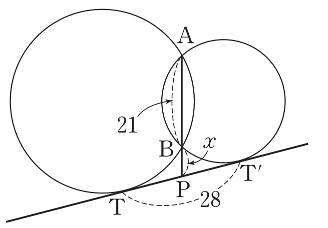
09



$8^2=x\times(x+12)$

$\therefore x=4\ (\because x>0)$

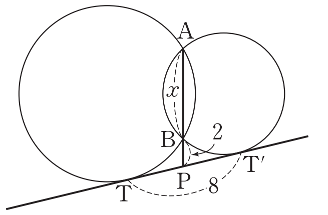
10



$14^2=x\times(x+21)$

$\therefore x=7\ (\because x>0)$

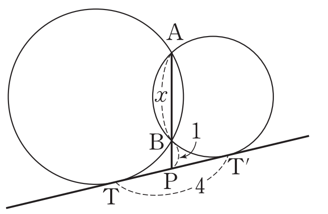
11



$4^2=2\times(2+x)$

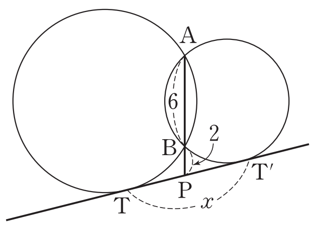
$\therefore x=6$

12



$2^2=1\times(1+x) \qquad \therefore x=3$

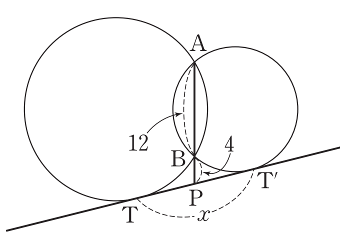
13



$\left(\frac{x}{2}\right)^2=2\times(2+6)$

$\therefore x=8\ (\because x>0)$

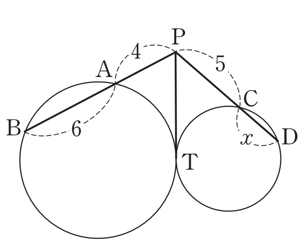
14



$\left(\frac{x}{2}\right)^2=4\times(4+12)$

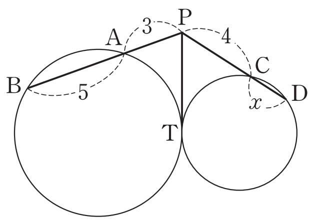
$\therefore x=16\ (\because x>0)$

16



$4\times(4+6)=5\times(5+x) \qquad \therefore x=3$

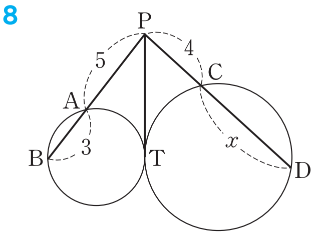
17



$3\times(3+5)=4\times(4+x)$

$\therefore x=2$

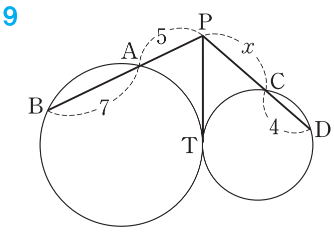
18



$5\times(5+3)=4\times(4+x)$

$\therefore x=6$

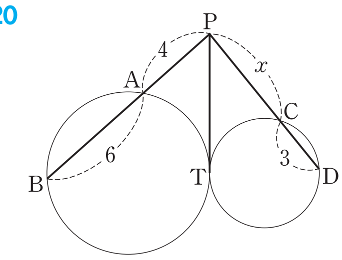
19



$5\times(5+7)=x\times(x+4)$

$\therefore x=6\ (\because x>0)$

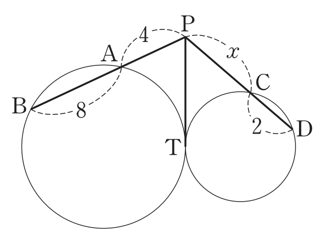
20



$4\times(4+6)=x\times(x+3)$

$\therefore x=5\ (\because x>0)$

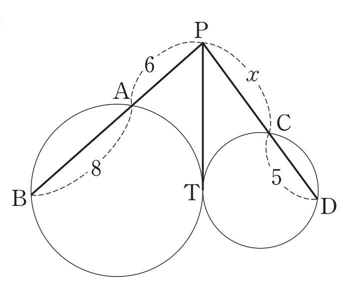
21



$4\times(4+8)=x\times(x+2)$

$\therefore x=6\ (\because x>0)$

22



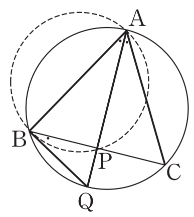
$6\times(6+8)=x\times(x+5)$

$\therefore x=7\ (\because x>0)$

20. 할선과 접선의 응용 (1) (본문 151쪽)

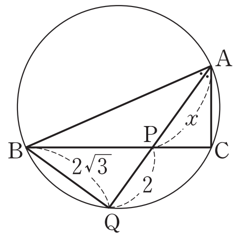
01 QC에 대한 원주각 ∠QBC, ∠QAC의 크기는 같다.

03



세 점 A, B, P를 지나는 원의 접선은 $\overline{BQ}$이다.

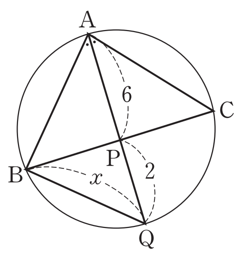
09



$(2\sqrt{3})^2=2\times(2+x)$

$\therefore x=4$

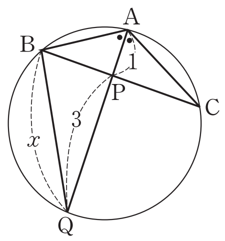
10



$x^2=2\times(2+6)$

$\therefore x=4\ (\because x>0)$

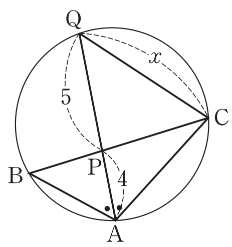
11



$x^2=3\times(3+1)$

$\therefore x=2\sqrt{3}\ (\because x>0)$

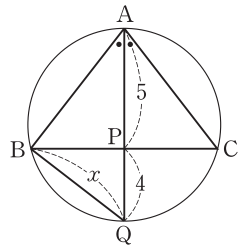
12



$x^2=5\times(5+4)$

$\therefore x=3\sqrt{5}\ (\because x>0)$

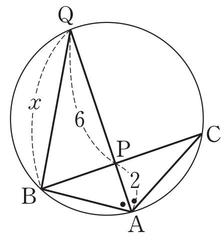
13



$x^2=4\times(4+5)$

$\therefore x=6\ (\because x>0)$

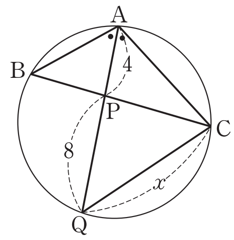
14



$x^2=6\times(6+2)$

$\therefore x=4\sqrt{3}\ (\because x>0)$

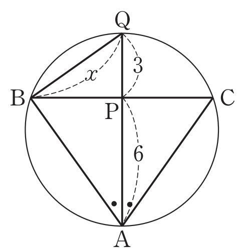
15



$x^2=8\times(8+4)$

$\therefore x=4\sqrt{6}\ (\because x>0)$

16



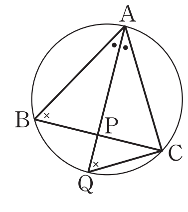
$x^2=3\times(3+6)$

$\therefore x=3\sqrt{3}\ (\because x>0)$

17 $\overset{\frown}{AC}$에 대한 원주각 ∠ABC, ∠AQC의 크기는 같다.

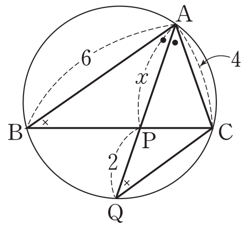
18 $\overset{\frown}{BQ}$에 대한 원주각 ∠BAQ, ∠BCQ의 크기는 같다.

19



∠ABP=∠AQC,
∠BAP=∠QAC이므로 △ABP와 △AQC는 닮음인 삼각형이다.

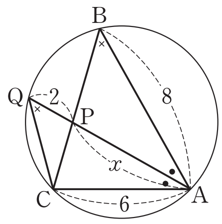
25



$6\times4=x\times(x+2)$

$\therefore x=4\ (\because x>0)$

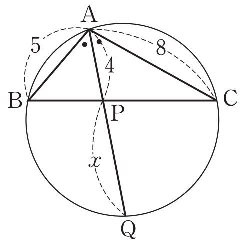
26



$8\times6=x\times(x+2)$

$\therefore x=6\ (\because x>0)$

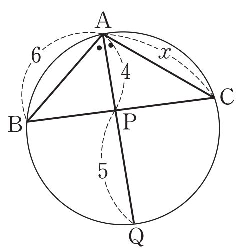
28



$5\times8=4\times(4+x)$

$\therefore x=6$

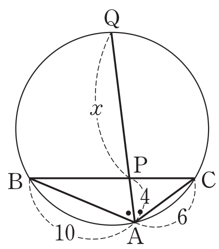
29



$6\times x=4\times(4+5)$

$\therefore x=6$

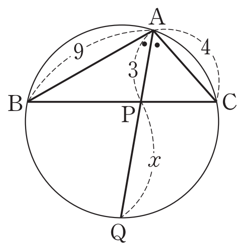
30



$10\times6=4\times(4+x)$

$\therefore x=11$

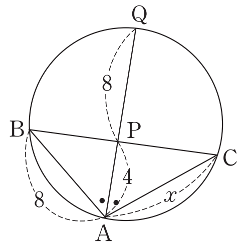
31



$9\times4=3\times(3+x)$

$\therefore x=9$

32

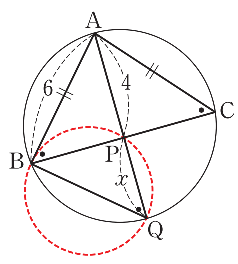


$8\times x=4\times(4+8)$

$\therefore x=6$

21. 할선과 접선의 응용 (2) (본문 155쪽)

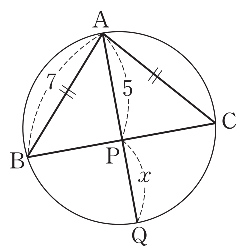
02



$6^2=4\times(4+x)$

$\therefore x=5$

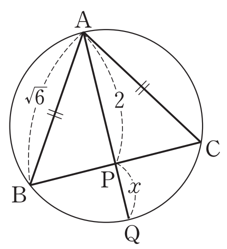
03



$7^2=5\times(5+x)$

$\therefore x=\frac{24}{5}$

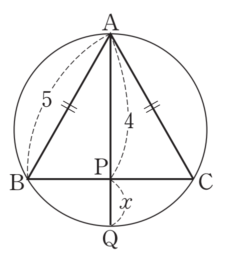
04



$(\sqrt{6})^2=2\times(2+x)$

$\therefore x=1$

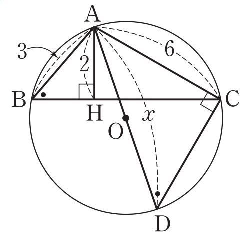
05



$5^2=4\times(4+x)$

$\therefore x=\frac{9}{4}$

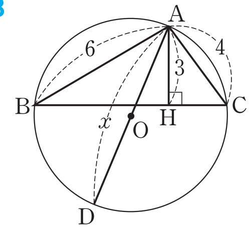
07



$3\times6=2\times x$

$\therefore x=9$

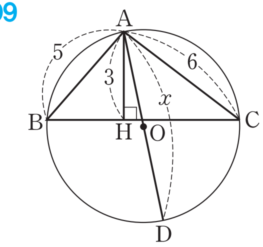
08



$6\times4=3\times x$

$\therefore x=8$

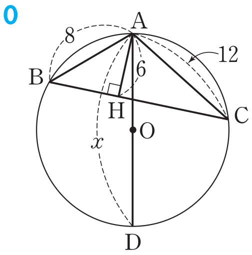
09



$5\times6=3\times x$

$\therefore x=10$

10



$8\times12=6\times x$

$\therefore x=16$