정답과 풀이

도형을 잡으면 수학이 완성된다!

기적의 중학도형

2권

길벗스쿨

정답과 풀이

| 스피드 정답 | 01~09쪽

각 문제의 정답만을 모아서 빠르게 정답을 확인할 수 있습니다.

| 친절한 풀이 | 10~36쪽

틀리기 쉽거나 헷갈리는 문제들의 풀이 과정을 친절하고 자세하게 실었습니다.

스피드 정답 스피드 정답은 각 문제의 정답만을 모아 놓아 채점하기에 유용합니다.

Chapter Ⅰ 삼각형의 성질

ACT 01 014~015쪽	01 8 02 5 03 70 04 90	05 35 06 20 07 115 08 5	09 8 10 90 11 40 12 7	13 6 14 5
ACT 02 016~017쪽	01 $\overline{AC}$, $\overline{AD}$, $\angle CAD$, $\triangle ACD$ / $\angle ACD$	02 $\overline{AC}$, $\angle CAD$, SAS / $\overline{CD}$ / $\angle ADC$, 180°, 90°, $\perp$	03 $\angle CAD$, $\angle C$, $\angle ADC$, $\overline{AD}$, $\triangle ACD$ / $\overline{AC}$	04 $\angle ACB$, $\angle DBC$, $\angle DCB$, $\angle ABC$, $\angle ACB$ / $\angle DCB$
ACT+ 03 018~019쪽	01 40°, 70° / 70°, 70°, 110° 02 115° 03 96°	04 ABC, 36°, 36°, 72° / CAD, 72°, 72°, 108° 05 120° 06 35°	07 ACB, 56°, 62°, 62°, 59° / 62°, 31°, 31°, 59°, 28° 08 32° 09 27°	10 DBA, 56°, 56°, 56°, 68° 11 40° 12 67°
ACT 04 020~021쪽	01 90°, $\overline{FD}$, $\angle FDE$, $\triangle FDE$, RHA 02 90°, $\overline{FD}$, $\overline{EF}$, $\triangle EFD$, RHS	03 ○ 04 × 05 ○ 06 ○	07 $\triangle DEF \equiv \triangle LKJ$ (RHA 합동) 08 $\triangle ABC \equiv \triangle IGH$ (RHS 합동) 09 $\triangle DEF \equiv \triangle HGI$ (RHA 합동)	10 30 11 30 12 3 13 6
ACT 05 022~023쪽	01 90°, $\overline{OP}$, BOP, RHA, 4 02 90°, $\overline{OP}$, $\overline{PA}$, RHS, AOP, 35°	03 3 04 20 05 68	06 3 07 14 08 3 09 4	10 25° 11 34° 12 72° 13 14°
ACT+ 06 024~025쪽	01 90°, $\overline{CD}$, $\overline{FC}$, RHS / 70°, 55° 02 24° 03 80°	04 90°, $\overline{AE}$, $\overline{AC}$, RHS / 36°, 27° 05 25° 06 42°	07 90°, $\overline{CA}$, 90°, 90°, $\angle EAC$, RHA / 3, 5, 8 08 15 09 4	10 90°, $\overline{AD}$, $\angle CAD$, RHA / 5, 5, 30 11 28 cm^2 12 9 cm^2
ACT 07 028~029쪽	01 ㉠, ㉣ 02 ○ 03 × 04 ○	05 × 06 12 07 40 08 56	09 3 10 4 11 10	12 OBA, 40°, 40°, 80°, 80 13 8 14 25π cm^2

ACT 08
030~031쪽

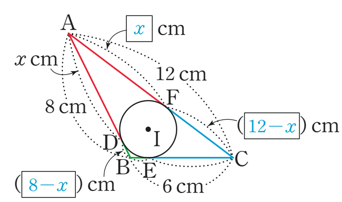
01 $\overrightarrow{\mathrm{PT}}$
02 점 T
03 25°
04 60°
05 55°
06 50°
07 108°
08 ㉢, ㉣
09 $\overline{\mathrm{EI}}$, $\overline{\mathrm{FI}}$
10 $\angle\mathrm{EBI}$
11 $\triangle\mathrm{AFI}$
12 42
13 6
14 45

ACT 09
032~033쪽

01 90°, 45°
02 30°
03 52°
04 55°, 110°
05 58°
06 84°
07 90°, 35°
08 25°
09 20°
10 62°, 121°
11 80°
12 32°

ACT 10
034~035쪽

01 84, 15, 4
02 60 cm^2
03 36 cm
04 25 cm
05 6, 24, 24, 8, 6, 2
06 4π cm^2
07 3
08 5
09 12
10



$\overline{\mathrm{AD}}$, $\overline{\mathrm{BD}}$, $8-x$, $\overline{\mathrm{FC}}$, $12-x$, $8-x$, $12-x$, 7
11 1
12 3

ACT+ 11
036~037쪽

01 $\angle\mathrm{CBI}$, $\angle\mathrm{DIB}$, $\angle\mathrm{DIB}$, $\overline{\mathrm{DB}}$, $\overline{\mathrm{EC}}$ / $\overline{\mathrm{DB}}$, $\overline{\mathrm{EC}}$, $\overline{\mathrm{AC}}$, 6, 8, 14
02 11 cm
03 2 cm
04 9 cm
05 17 cm
06 BOC, 144°, 72° / 90°, 90°, 72°, 126°
07 115°
08 80°
09 A, 40°, 80°, $\overline{\mathrm{OC}}$, 80°, 50° / 40°, 70°, ABC, 70°, 35° / OBC, 50°, 35°, 15°
10 54°
11 36°
12 18°

TEST 01
038~039쪽

01 ③
02 ㈎ $\angle\mathrm{ACB}$ ㈏ $\angle\mathrm{ABC}$ ㈐ $\angle\mathrm{ACB}$ ㈑ $\angle\mathrm{DCB}$
03 40°
04 ⑤
05 66°
06 50°
07 10
08 54°
09 36π cm^2
10 32°
11 88°
12 20 cm
13 13 cm
14 22 cm
15 124°

Chapter Ⅱ 사각형의 성질

ACT 12
044~045쪽

01 $\overline{BC}$
02 $\angle A$
03 ×
04 ×
05 ○
06 $x=5$, $y=8$
07 $x=10$, $y=6$
08 $x=5$, $y=4$
09 $\angle x=55°$, $\angle y=125°$
10 $\angle x=130°$, $\angle y=50°$
11 $\angle x=75°$, $\angle y=65°$
12 $\angle x=45°$, $\angle y=55°$
13 $x=5$, $y=6$
14 $x=6$, $y=8$
15 $x=7$, $y=3$
16 $x=6$, $y=1$

ACT+ 13
046~047쪽

01 70°
02 22°
03 70°
04 25°
05 180°, 2, 3, 180°, 3, 108°, B, 108°
06 100°
07 60°
08 $\angle$DAE, $\angle$BEA, 이등변삼각형 / D, 70°, 70°, 55°, 55°, 125°
09 145°
10 122°
11 AED, 52°, AED, 52°, 2, 52°, 104°
12 70°
13 53°

ACT+ 14
048~049쪽

01 $\angle$BEA, $\angle$BEA, 이등변삼각형 / 6, 8, 6, 2
02 3
03 3
04 $\angle$BEC, $\angle$BEC, 이등변삼각형 / 9, 9, 3
05 3
06 4
07 $\angle$FCE, $\overline{CE}$, $\angle$FEC, ASA / 8, 8, 8, 16
08 12
09 8
10 $\angle$AFB, $\angle$DEC, 이등변삼각형 / 6, 6, 6, 6, 8, 4
11 3
12 6

ACT 15
050~051쪽

01 $\overline{DC}$, $\overline{BC}$
02 $\overline{DC}$, $\overline{BC}$
03 $\angle$C, $\angle$D
04 $\overline{OC}$, $\overline{OD}$
05 $\overline{DC}$, $\overline{DC}$
06 ㉠ 두 쌍의 대변의 길이가 각각 같다.
㉢ 두 대각선이 서로 다른 것을 이등분한다.
㉥ 두 쌍의 대각의 크기가 각각 같다.
07 ○
08 ×
09 ○
10 ×
11 ○
12 ○
13 4, 5
14 65, 115
15 10, 3
16 10
17 60, 7

ACT+ 16
052~053쪽

01 $/\!/$, $\overline{BC}$, $\overline{BF}$, 한 쌍의 대변이 평행하고 그 길이가 같으므로
02 $\angle$EDF, $\angle$EBF, 엇각, $\angle$DFC, $\angle$DFB, 두 쌍의 대각의 크기가 각각 같으므로
03 $\overline{AB}$, $\overline{CG}$, $\overline{BC}$, $\overline{CF}$, $\angle$C, SAS, $\overline{GF}$, $\triangle$DHG, $\overline{GH}$, 두 쌍의 대변의 길이가 각각 같으므로
04 $\overline{OD}$, $\overline{OC}$, $\overline{OF}$, 두 대각선이 서로 다른 것을 이등분하므로
05 90°, $\overline{CD}$, $\angle$DCF, RHA, $\overline{DF}$, 90°, $/\!/$, 한 쌍의 대변이 평행하고 그 길이가 같으므로
06 $\overline{GO}$, $\overline{HO}$, 두 대각선이 서로 다른 것을 이등분하므로
07 $\overline{FC}$, $\overline{FC}$, 평행사변형, $\overline{QC}$, $\overline{GC}$, $\overline{GC}$, 평행사변형, $\overline{AQ}$, 두 쌍의 대변이 각각 평행하므로
08 $\overline{EH}$, $\overline{HF}$, 두 쌍의 대변의 길이가 각각 같으므로

ACT 17
054~055쪽

01 26 cm^2
02 26 cm^2
03 13 cm^2
04 8 cm^2
05 16 cm^2
06 32 cm^2
07 12 cm^2
08 48 cm^2
09 15 cm^2
10 15 cm^2
11 8 cm^2
12 19 cm^2
13 12 cm^2
14 14 cm^2

ACT 18
058~059쪽

01 ㉡, ㉢
02 8 cm
03 4 cm
04 $40°$
05 $50°$
06 $x=5$, $y=35$
07 $x=12$, $y=60$
08 $x=14$, $y=67$
09 ㉢, ㉣
10 8 cm
11 8 cm
12 $90°$
13 $30°$
14 $x=8$, $y=40$
15 $x=6$, $y=62$
16 $x=9$, $y=110$

ACT 19
060~061쪽

01 ○
02 ×
03 ○
04 ×
05 ○
06 90
07 14
08 6
09 10
10 ○
11 ×
12 ○
13 ×
14 ○
15 6
16 90
17 55
18 42

ACT 20
062~063쪽

01 ㉡, ㉢, ㉣
02 10 cm
03 5 cm
04 $90°$
05 $45°$
06 $x=9$, $y=45$
07 $x=12$, $y=90$
08 $x=12$, $y=81$
09 ㉠, ㉡
10 7 cm
11 12 cm
12 $70°$
13 $110°$
14 $x=9$, $y=55$
15 $x=10$, $y=75$
16 $x=9$, $y=36$

ACT 21
064~065쪽

01 ○
02 ×
03 ○
04 ○
05 ×
06 ×
07 ○
08 ×
09 ×
10 ○
11 5
12 90
13 8
14 45
15 마름모
16 직사각형
17 마름모
18 직사각형
19 마름모
20 정사각형
21 정사각형

ACT 22
066~067쪽

01 ① $\overline{AB} /\!/ \overline{DC}$ ② $\overline{AC}=\overline{BD}$
③ $\overline{AC} \perp \overline{BD}$ ④ $\overline{AC} \perp \overline{BD}$
⑤ $90°$
02 (왼쪽 위부터) ○, ○, ○, ○ /
○, ○, ○, ○ /
×, ×, ○, ○
03 ○
04 ×
05 ○
06 ×
07 ㉢, ㉤, ㉥
08 ㉡, ㉢, ㉣, ㉤
09 ㉣, ㉤
10 ㉤
11 ×
12 ○
13 ×
14 ○
15 ○

ACT+ 23
068~069쪽

01 $\overline{CP}$, $\overline{DC}$, DCP, $45°$, SAS, PBC, $30°$ / $30°$, $45°$, $75°$
02 $85°$
03 $\overline{BC}$, $\angle BCF$, $90°$, SAS, x / $90°$, $115°$, $25°$
04 $35°$
05 $60°$, 정삼각형, 9 / 평행사변형, 6, 9, 6, 15
06 11
07 6
08 $90°$, $\overline{DC}$, $\angle C$, RHA / 6, 6, 4
09 2
10 13

ACT 24
070~071쪽

01 $\triangle DBC$
02 $\triangle ACD$
03 $\triangle DCO$
04 $\triangle ACD$
05 $\triangle ABE$
06 15 cm^2
07 17 cm^2
08 9 cm^2
09 ACE, 10, 18, 28
10 20 cm^2
11 10 cm^2
12 23 cm^2
13 ACE, ABE, 10, 6, 8, 64
14 20 cm^2
15 49 cm^2
16 25 cm^2

ACT 25 072~073쪽

01 3, 2, $\frac{2}{5}$, 12 / 1, 3, $\frac{3}{4}$, 9
02 10 cm^2
03 10 cm^2
04 18 cm^2
05 20 cm^2
06 2, 1, 2, 1, 6 / ABO, 6, 2, 6, 2, 12 / 6, 6, 12, 27
07 50 cm^2
08 15 cm^2
09 27 cm^2
10 14 cm^2
11 16 cm^2

TEST 02 074~075쪽

01 $x=12$, $y=80$
02 45°
03 4
04 10
05 (1) $x=35$, $y=55$ (2) $x=6$, $y=5$
06 ②, ⑤
07 평행사변형
08 10 cm^2
09 ③, ⑤
10 ③
11 6 cm
12 정사각형
13 ③, ④
14 8 cm^2
15 $\frac{35}{2}$ cm^2

Chapter Ⅲ 도형의 닮음

ACT 26 080~081쪽

01 $\overline{EF}$
02 ∠C
03 모서리 FH
04 면 EFH
05 ○
06 ×
07 ○
08 ×
09 ○
10 10, 5
11 5, 3, 5, 5
12 F, 60°
13 60°, 30°
14 2 : 3
15 6 cm
16 3 cm
17 면 A′E′F′B′

ACT 27 082~083쪽

01 2 : 3
02 2 : 3
03 3 : 5
04 9 : 25
05 2 : 5
06 4 : 25
07 2 : 3
08 4 : 9
09 3 : 4
10 9 : 16
11 9, 16, 48, 48
12 2 : 3
13 2 : 3
14 16 cm
15 1 : 2
16 9π cm
17 3 : 5
18 9 : 25
19 75π cm^2

ACT 28 084~085쪽

01 2 : 3
02 4 : 9
03 2 : 3
04 8 : 27
05 9 : 25
06 27 : 125
07 4 : 25
08 8 : 125
09 5 : 3
10 25 : 9
11 36 cm^2
12 3 : 4
13 3 : 4
14 27 : 64
15 81π cm^3
16 4 : 1
17 16π cm^2
18 27 : 1
19 4π cm^3

ACT 29 086~087쪽

01 6, 2, 3, 6, 2, 3, △DFE, SSS
02 8, 2, 1, ∠F, △EFD, SAS
03 40°, 60°, 80°, ∠D, ∠F, △EDF, AA
04 △JKL∽△ONM (SAS 닮음)
05 △ABC∽△PRQ (SSS 닮음)
06 △DEF∽△TUS (AA 닮음)
07 △GHI∽△VXW (SAS 닮음)
08 ○
09 ○
10 ×
11 △ABC∽△ACD (SSS 닮음)
12 △ABC∽△ADE (SAS 닮음)
13 △ABC∽△AED (AA 닮음)

ACT+ 30
088~089쪽

- 01 D, 6 / 3, 2, B, △DBA, SAS / 3, 2, 3, 2, 6
- 02 12
- 03 12
- 04 E, D / A, AED, △AED, AA / 2, 1, 2, 1, 5
- 05 6
- 06 3
- 07 △ADE, A, ABC, △ADE, AA / 10, 5, 3, 5, 3, 25, 9, 25, 9, 18 / 18, 32
- 08 12 cm^2
- 09 36 cm^2
- 10 35 cm^2
- 11 20 cm^2
- 12 20 cm^2

ACT 31
090~091쪽

- 01 ∠B, ∠BHA, △HBA, AA
- 02 ∠C, ∠BAC, △HAC, AA
- 03 90°, ∠HCA, ∠HCA, △HAC, AA
- 04 6
- 05 9
- 06 $\frac{24}{5}$
- 07 $\frac{32}{5}$
- 08 3
- 09 $\frac{40}{3}$

ACT 32
092~093쪽

- 01 (위부터) 1, 10 / 1, 1000 / 1000
- 02 500, 1000 / 50000, 1000 / 50
- 03 4, 1000 / 4, 1000 / 4000 / 40
- 04 2 km
- 05 8 cm
- 06 72 m
- 07 8.5 m
- 08 150 m
- 09 12.8 m

ACT+ 33
094~095쪽

- 01 AA / $\overline{AC}$, $\overline{AE}$, 8, 4, $\frac{8}{3}$
- 02 $\frac{25}{6}$
- 03 20
- 04 16
- 05 10
- 06 5
- 07 $\frac{7}{3}$
- 08 ∠D, ∠AFB, 90°, ∠DFE, △DFE, AA / $\overline{BF}$, 15, 3, 3, 15, 5
- 09 4
- 10 15
- 11 ∠C, ∠BED, 120°, ∠CEF, △CEF, AA / $\overline{EF}$, 7, 7, 5, 5, 7, $\frac{28}{5}$
- 12 $\frac{35}{4}$
- 13 $\frac{156}{7}$

TEST 03
096~097쪽

- 01 ②, ③
- 02 ④
- 03 98
- 04 12
- 05 27 cm
- 06 324π cm^3
- 07 ②
- 08 12
- 09 9
- 10 $\frac{18}{5}$
- 11 12 cm
- 12 6 cm
- 13 ④
- 14 11
- 15 20 cm

ACT 34
100~101쪽

- 01 ∠AED, AA, $\overline{EF}$, $\overline{EF}$
- 02 12, 8, 6
- 03 4
- 04 8
- 05 3
- 06 9
- 07 8
- 08 ×
- 09 ○
- 10 ×
- 11 ○

ACT 35
102~103쪽

- 01 6, 6, 4
- 02 10
- 03 6
- 04 6
- 05 9
- 06 4
- 07 12, 8, 4
- 08 9
- 09 6
- 10 8
- 11 4
- 12 10

ACT 36
104~105쪽

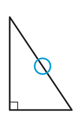
- 01 6, 6, 9
- 02 8
- 03 9
- 04 8, 10, $\frac{15}{2}$
- 05 10
- 06 $\frac{20}{3}$
- 07 (1) 4 (2) 9
- 08 (1) 4 (2) 14
- 09 7
- 10 12
- 11 13

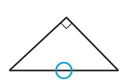
ACT 37 106~107쪽	01 (1) 4 (2) 4 (3) 8 02 (1) 4 (2) $\frac{8}{3}$ (3) $\frac{20}{3}$	03 7 04 11 05 13	06 (1) 2 : 3 (2) 2 : 5 (3) $\frac{12}{5}$ (4) $\frac{16}{5}$ 07 (1) 2 : 1 (2) 2 : 3 (3) $\frac{10}{3}$ (4) 6	08 $\frac{24}{5}$ 09 $\frac{20}{3}$ 10 6
ACT 38 108~109쪽	01 10 02 6 03 60	04 6 05 8 06 8	07 11 08 3 09 2, 8, $\frac{1}{2}$, 4 10 1	11 9 12 6 13 2 14 3
ACT 39 110~111쪽	01 (1) 6 (2) 4 (3) 10 02 (1) 5 (2) 3 (3) 8	03 7 04 8 05 12	06 (1) $\frac{9}{2}$ (2) $\frac{15}{2}$ (3) 3 07 (1) 3 (2) 4 (3) 1	08 $\frac{3}{2}$ 09 12 10 12
ACT+ 40 112~113쪽	01 $\frac{1}{2}$, $\frac{1}{2}$, 4, $\overline{BC}$, 16, 8, $\overline{AC}$, 12, 6 / 4, 8, 6, 18	02 17 03 11 04 13 05 12	06 ❶ $\frac{1}{2}$, $\frac{1}{2}$, 8 ❷ $\frac{1}{2}$, $\frac{1}{2}$, 8 ❸ $\overline{BD}$, 12, 6 ❹ $\overline{BD}$, 12, 6 / 6, 28	07 24 08 18 09 16 10 21
ACT+ 41 114~115쪽	01 $/\!/$, 2, 2, 16 / $\frac{1}{2}$, $\frac{1}{2}$, 4 / 16, 4, 12 02 7	03 15 04 6 05 18 06 9	07 2, 2, 8 / $\angle$EDC, $\angle$CED, $\overline{ED}$, ASA, 4 / 8, 4, 12 08 9	09 10 10 6 11 3 12 10
ACT 42 118~119쪽	01 12 cm^2 02 6 cm^2 03 4 cm^2	04 9 cm^2 05 18 cm^2 06 3 cm^2	07 6 08 $\frac{9}{2}$ 09 12	10 $x=4$, $y=15$ 11 $x=7$, $y=5$ 12 $x=6$, $y=4$
ACT 43 120~121쪽	01 8 cm^2 02 4 cm^2 03 4 cm^2	04 8 cm^2 05 8 cm^2 06 12 cm^2	07 6 cm^2 08 3 cm^2 09 6 cm^2 10 18 cm^2	11 3 cm^2 12 12 cm^2 13 6 cm^2 14 $\frac{3}{2}$ cm^2
ACT+ 44 122~123쪽	01 $\frac{1}{3}$, $\frac{1}{3}$, 6 / $\frac{2}{3}$, $\frac{2}{3}$, 6, 4 02 27	03 $\frac{16}{3}$ 04 18 05 18 06 2 cm^2	07 $\overline{EC}$, $\overline{EF}$, 6, 12 / $\frac{2}{3}$, $\frac{2}{3}$, 12, 8 08 6 09 3	10 3, 4, 3, 6 11 4 12 4

ACT+ 45 124~125쪽	01 무게중심, $\overline{OQ}$, $\frac{1}{3}$, $\frac{1}{3}$, $\overline{BD}$, 12, 4 / 02 6 / 03 12 / 04 30 / 05 18 / 06 △ABC, $\frac{1}{6}$, $\frac{1}{6}$, $\frac{1}{2}$, $\frac{1}{12}$, $\frac{1}{12}$, 48, 4 / △ACD, 4, 4, 16 / 07 8 cm^2 / 08 4 cm^2 / 09 8 cm^2 / 10 8 cm^2
TEST 04 126~127쪽	01 20 / 02 30 / 03 ④ / 04 4 cm / 05 4 cm / 06 6 / 07 3 cm / 08 12 cm / 09 16 cm / 10 12 cm / 11 8 cm^2 / 12 12 / 13 36 cm^2 / 14 $\frac{8}{3}$ cm / 15 24 cm

Chapter Ⅳ 피타고라스 정리

ACT 46 132~133쪽

01 

02 

03 4, 25, 5
04 15
05 8
06 8
07 12
08 9
09 5, 144, 12 / 12, 400, 20
10 $x=8$, $y=10$
11 $x=12$, $y=13$
12 17, 64, 8 / 8, 625, 25
13 $x=12$, $y=15$
14 $x=8$, $y=17$

ACT+ 47 134~135쪽

01 10
02 120
03 65
04 9, 225, 15 / 15, 64, 8
05 13
06 3, 9, 3, 6 / 6, 64, 8, 8
07 13
08 17
09 7, 85 / 2, 85, 81, 9
10 20
11 7

ACT 48 136~137쪽

01 SAS, △LAF, □AFML / SAS, △LBG, □LMGB / □BHIC, $\overline{BC}^2+\overline{CA}^2$
02 20, 30, 50
03 33 cm^2
04 56 cm^2
05 10, 6, 4, 2
06 5 cm
07 10 cm
08 144
09 36 cm^2
10 200 cm^2

ACT 49 138~139쪽

01 (1) 20 (2) 25
02 (1) 68 (2) 289
03 36
04 144
05 196
06 (1) 3 (2) 9
07 (1) 7 (2) 49
08 (1) 13 (2) $\frac{169}{2}$
09 (1) 17 (2) $\frac{289}{2}$

ACT 50
140~141쪽

01	×	05	○	10	$>$, 둔각삼각형	15	8, 8, $<$, $<$, 9
02	○	06	×	11	예각삼각형	16	6
03	×	07	×	12	예각삼각형	17	13, 14
04	○	08	○	13	둔각삼각형		
		09	×	14	직각삼각형		

ACT 51
142~143쪽

01	$x=25$, $y=20$	04	5, 4, 18	07	6, 10, 113	10	8, 5, 75
02	$x=5$, $y=\frac{12}{5}$	05	180	08	33	11	62
03	$x=\frac{120}{17}$, $y=15$	06	33	09	63	12	45

ACT 52
144~145쪽

01	30π, 16π	04	2, 2π, 2π, 8π	07	5, 12	11	3, 16, 4, 4, 6
02	43π	05	$\frac{45}{2}\pi$	08	18 cm^2	12	30 cm^2
03	13π	06	17π	09	6 cm^2	13	60 cm^2
				10	19 cm^2		

TEST 05
146~147쪽

01	12	05	32 cm^2	08	㉠, ㉢	12	32
02	6	06	529	09	㉡, ㉤, ㉥	13	19
03	20	07	③	10	5개	14	12π
04	17			11	$\frac{60}{13}$	15	54

Chapter I 삼각형의 성질

ACT 01 014~015쪽

04 $\angle B=180^\circ-2\times45^\circ=90^\circ$
$\therefore x=90$

05 $\angle C=\frac{1}{2}\times(180^\circ-110^\circ)=35^\circ$
$\therefore x=35$

06 $\angle ACB=180^\circ-100^\circ=80^\circ$
$\angle A=180^\circ-2\times80^\circ=20^\circ$
$\therefore x=20$

07 $\angle BAC=\frac{1}{2}\times(180^\circ-50^\circ)=65^\circ$
$x^\circ=180^\circ-65^\circ=115^\circ$
$\therefore x=115$

08 $\overline{DC}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times10=5\ (\text{cm})$
$\therefore x=5$

09 $\overline{BC}=2\overline{BD}=2\times4=8\ (\text{cm})$
$\therefore x=8$

11 $\angle BDA=90^\circ$이므로
$\angle BAD=180^\circ-(50^\circ+90^\circ)=40^\circ$
$\therefore x=40$

13 $\angle B=180^\circ-(40^\circ+100^\circ)=40^\circ$
따라서 $\triangle ABC$는 $\overline{CA}=\overline{CB}$인 이등변삼각형이다.
$\therefore x=6$

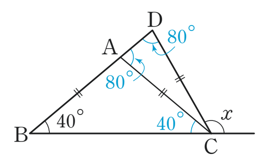
14 $\angle BAC=60^\circ-30^\circ=30^\circ$
따라서 $\triangle ABC$는 $\overline{BA}=\overline{BC}$인 이등변삼각형이다.
$\therefore x=5$

ACT+ 03 018~019쪽

02 $\angle C=\frac{1}{2}\times(180^\circ-50^\circ)=65^\circ$
$\angle BDC=\angle BCD=65^\circ$
$\therefore \angle x=180^\circ-65^\circ=115^\circ$

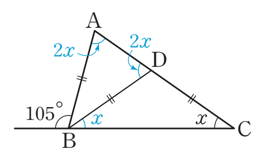
03 $\angle B=\frac{1}{2}\times(180^\circ-52^\circ)=64^\circ$이고
$\angle ABD=\frac{1}{2}\times64^\circ=32^\circ$이므로 $\angle x=180^\circ-(52^\circ+32^\circ)=96^\circ$

05



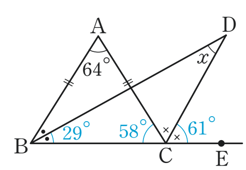
$\angle ACB=\angle ABC=40^\circ$
$\triangle ABC$에서 $\angle DAC=40^\circ+40^\circ=80^\circ$
$\angle CDA=\angle CAD=80^\circ$이므로
$\triangle DBC$에서 $\angle x=40^\circ+80^\circ=120^\circ$

06



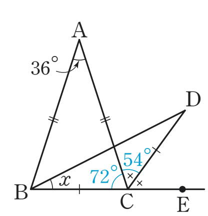
$\angle DBC=\angle DCB=\angle x$
$\triangle DBC$에서 $\angle ADB=\angle x+\angle x=2\angle x$
$\angle BAD=\angle BDA=2\angle x$이므로
$\triangle ABC$에서 $\angle x+2\angle x=105^\circ$
$3\angle x=105^\circ \qquad \therefore \angle x=35^\circ$

08



$\angle ABC=\angle ACB=\frac{1}{2}\times(180^\circ-64^\circ)=58^\circ$
$\angle DBC=\frac{1}{2}\times58^\circ=29^\circ$
$\angle DCE=\frac{1}{2}\angle ACE=\frac{1}{2}\times(180^\circ-58^\circ)=61^\circ$
$\triangle DBC$에서 $29^\circ+\angle x=61^\circ$
$\therefore \angle x=61^\circ-29^\circ=32^\circ$

09



$\angle ACB=\frac{1}{2}\times(180^\circ-36^\circ)=72^\circ$
$\angle ACD=\frac{1}{2}\angle ACE=\frac{1}{2}\times(180^\circ-72^\circ)=54^\circ$
$\triangle DBC$에서 $\angle BCD=72^\circ+54^\circ=126^\circ$
$\therefore \angle x=\frac{1}{2}\times(180^\circ-126^\circ)=27^\circ$

11 $\angle DBC=\angle DBA=70°$ (접은 각)
$\overline{AD}/\!/\overline{BC}$이므로
$\angle ADB=\angle DBC=70°$ (엇각)
$\triangle ABD$에서 $\angle x=180°-2\times70°=40°$

12 $\angle BAC=\angle x$ (접은 각)
$\overline{AD}/\!/\overline{BC}$이므로 $\angle ABC=\angle x$ (엇각)
$\triangle ABC$에서 $\angle x=\frac{1}{2}\times(180°-46°)=67°$
다른 풀이
$\angle BAC=\angle x$ (접은 각)
$\overline{AD}/\!/\overline{BC}$이므로 $\angle DAC=46°$
$2\angle x+46°=180°$ $\therefore \angle x=67°$

ACT 04 020~021쪽

03 $\triangle ABC\equiv\triangle DEF$ (RHS 합동)

05 $\triangle ABC\equiv\triangle DEF$ (RHA 합동)

06 $\triangle ABC\equiv\triangle DEF$ (ASA 합동)

07 $\triangle DEF$에서 $\angle FDE=180°-(90°+25°)=65°$
$\triangle DEF$와 $\triangle LKJ$에서
$\angle E=\angle K=90°$,
$\overline{DF}=\overline{LJ}$, $\angle FDE=\angle JLK$
$\therefore \triangle DEF\equiv\triangle LKJ$ (RHA 합동)

08 $\triangle ABC$와 $\triangle IGH$에서
$\angle A=\angle I=90°$,
$\overline{BC}=\overline{GH}$, $\overline{AB}=\overline{IG}$
$\therefore \triangle ABC\equiv\triangle IGH$ (RHS 합동)

09 $\triangle DEF$에서 $\angle EDF=180°-(90°+30°)=60°$
$\triangle DEF$와 $\triangle HGI$에서
$\angle F=\angle I=90°$,
$\overline{DE}=\overline{HG}$, $\angle EDF=\angle GHI$
$\therefore \triangle DEF\equiv\triangle HGI$ (RHA 합동)

10 $\triangle ABC$와 $\triangle DEF$에서
$\angle B=\angle E=90°$,
$\overline{AC}=\overline{DF}$, $\overline{AB}=\overline{DE}$
따라서 $\triangle ABC\equiv\triangle DEF$ (RHS 합동)이므로
$\angle C=\angle F=30°$ $\therefore x=30$

11 $\triangle ABC$와 $\triangle DFE$에서
$\angle B=\angle F=90°$, $\overline{AC}=\overline{DE}$, $\overline{BC}=\overline{FE}$
따라서 $\triangle ABC\equiv\triangle DFE$ (RHS 합동)이므로
$\angle E=\angle C=60°$
$\triangle DEF$에서 $\angle D=180°-(90°+60°)=30°$
$\therefore x=30$

12 $\triangle ABC$에서 $\angle A=180°-(90°+30°)=60°$
$\triangle ABC$와 $\triangle DFE$에서
$\angle C=\angle E=90°$
$\overline{AB}=\overline{DF}$, $\angle BAC=\angle FDE$
따라서 $\triangle ABC\equiv\triangle DFE$ (RHA 합동)이므로
$\overline{AC}=\overline{DE}=3$ cm $\therefore x=3$

13 $\triangle ABC$에서 $\angle A=180°-(90°+30°)=60°$
$\triangle ABC$와 $\triangle EDF$에서
$\angle C=\angle F=90°$, $\overline{AB}=\overline{ED}$, $\angle BAC=\angle DEF$
따라서 $\triangle ABC\equiv\triangle EDF$ (RHA 합동)이므로
$\overline{EF}=\overline{AC}=6$ cm $\therefore x=6$

ACT 05 022~023쪽

03 $\triangle ABD\equiv\triangle CBD$ (RHA 합동)이므로
$\overline{CD}=\overline{AD}=3$ cm $\therefore x=3$
다른 풀이
각의 이등분선 위의 한 점에서 그 각의
두 변까지의 거리는 같으므로
$\overline{CD}=\overline{AD}=3$ cm $\therefore x=3$

04 $\triangle ABD$에서 $\angle ABD=180°-(90°+70°)=20°$
$\triangle ABD\equiv\triangle CBD$ (RHS 합동)이므로
$\angle DBC=\angle DBA=20°$ $\therefore x=20$
다른 풀이
각의 두 변에서 같은 거리에 있는 점은
그 각의 이등분선 위에 있으므로
$\angle DBC=\angle DBA=20°$ $\therefore x=20$

05 $\triangle ABD\equiv\triangle CBD$ (RHS 합동)이므로
$\angle ABD=\frac{1}{2}\times44°=22°$
$\triangle ABD$에서 $\angle ADB=180°-(90°+22°)=68°$
$\therefore x=68$

06 $\triangle DBE\equiv\triangle CBE$ (RHA 합동)이므로
$x=\overline{EC}=3$

07 $\triangle DBE\equiv\triangle CBE$ (RHA 합동)이므로
$\overline{BD}=\overline{BC}=10$
$\therefore x=\overline{BD}+\overline{DA}=10+4=14$

08 $\triangle ADE \equiv \triangle ACE$ (RHA 합동)이므로
$\overline{AD}=\overline{AC}=5$
$\therefore x=\overline{AB}-\overline{AD}=8-5=3$

09 $\triangle DBE \equiv \triangle CBE$ (RHA 합동)이므로
$\overline{BD}=\overline{BC}=6$
$\therefore x=\overline{AB}-\overline{BD}=10-6=4$

10 $\triangle DBE \equiv \triangle CBE$ (RHS 합동)이므로
$\angle x=\angle EBC=\frac{1}{2}\angle ABC$
$=\frac{1}{2}\times\{180^\circ-(90^\circ+40^\circ)\}=25^\circ$

11 $\triangle DBE \equiv \triangle CBE$ (RHS 합동)이므로
$\angle EBC=\angle EBD=28^\circ$
$\therefore \angle ABC=28^\circ+28^\circ=56^\circ$
$\therefore \angle x=180^\circ-(90^\circ+56^\circ)=34^\circ$

12 $\triangle ABD \equiv \triangle AED$ (RHS 합동)이므로
$\angle BAD=\angle EAD=\frac{1}{2}\angle BAC$
$=\frac{1}{2}\times\{180^\circ-(90^\circ+54^\circ)\}=18^\circ$
$\therefore \angle x=180^\circ-(90^\circ+18^\circ)=72^\circ$

13 $\triangle ABD \equiv \triangle AED$ (RHS 합동)이므로
$\angle DAE=\angle DAB=38^\circ$
$\therefore \angle BAC=38^\circ+38^\circ=76^\circ$
$\therefore \angle x=180^\circ-(90^\circ+76^\circ)=14^\circ$

ACT+ 06 024~025쪽

02 $\triangle EBD \equiv \triangle FCD$ (RHS 합동)이므로
$\angle B=\frac{1}{2}\times(180^\circ-48^\circ)=66^\circ$
$\therefore \angle x=180^\circ-(90^\circ+66^\circ)=24^\circ$

03 $\triangle EBD \equiv \triangle FCD$ (RHS 합동)이므로
$\angle C=\angle B=50^\circ$
$\therefore \angle x=180^\circ-2\times50^\circ=80^\circ$

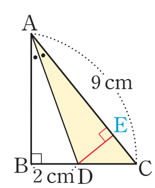
05 $\triangle ABE \equiv \triangle DBE$ (RHS 합동)이므로
$\angle x=\frac{1}{2}\angle ABD=\frac{1}{2}\times\{180^\circ-(90^\circ+40^\circ)\}=25^\circ$

06 $\triangle ABD \equiv \triangle AED$ (RHS 합동)이므로
$\angle DAE=\angle DAB=24^\circ$
$\therefore \angle BAC=24^\circ+24^\circ=48^\circ$
$\therefore \angle x=180^\circ-(90^\circ+48^\circ)=42^\circ$

08 $\triangle ADB \equiv \triangle BEC$ (RHA 합동)이므로
$\overline{DB}=\overline{EC}=8$, $\overline{BE}=\overline{AD}=7$
$\therefore x=\overline{DB}+\overline{BE}=8+7=15$

09 $\triangle DBA \equiv \triangle EAC$ (RHA 합동)이므로
$\overline{DA}=\overline{EC}=x$, $\overline{AE}=\overline{BD}=6$
$\therefore x=\overline{DA}=\overline{DE}-\overline{AE}=10-6=4$

11 $\triangle ADE \equiv \triangle ADC$ (RHA 합동)이므로
$\overline{DE}=\overline{DC}=4$ cm
$\therefore \triangle ABD=\frac{1}{2}\times14\times4=28$ (cm^2)

12


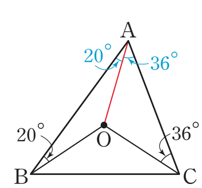
점 D에서 $\overline{AC}$에 내린 수선의 발을 E라고 하면
$\triangle ABD \equiv \triangle AED$ (RHA 합동)이므로
$\overline{DE}=\overline{DB}=2$ cm
$\therefore \triangle ADC=\frac{1}{2}\times9\times2=9$ (cm^2)

ACT 07 028~029쪽

04 $\triangle OBC$에서 $\overline{OB}=\overline{OC}$이므로
$\angle OBE=\angle OCE$

06 $\overline{OD}$는 $\overline{AC}$의 수직이등분선이므로
$\overline{CD}=\overline{AD}=6$ cm
따라서 $\overline{AC}=6+6=12$ (cm)이므로 $x=12$

07 $\overline{OA}=\overline{OB}$이므로
$\angle ABO=\frac{1}{2}\times(180^\circ-100^\circ)=40^\circ$
$\therefore x=40$

08


$\overline{OA}$를 그으면 $\overline{OA}=\overline{OB}$이므로
$\angle OAB=\angle OBA=20^\circ$
또한 $\overline{OA}=\overline{OC}$이므로
$\angle OAC=\angle OCA=36^\circ$
따라서 $\angle BAC=20^\circ+36^\circ=56^\circ$이므로 $x=56$

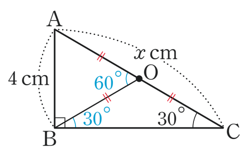
10 $\overline{OA}=\overline{OB}=\overline{OC}$이므로

$\overline{OC}=\frac{1}{2}\times 8=4\ (cm)$ $\therefore\ x=4$

11 $\overline{OA}=\overline{OB}=\overline{OC}$이므로

$\overline{BC}=2\times 5=10\ (cm)$ $\therefore\ x=10$

13



$\overline{OA}=\overline{OB}=\overline{OC}$이고 $\triangle OAB$가 정삼각형이므로

$\overline{AC}=2\times 4=8\ (cm)$

$\therefore\ x=8$

14 외접원의 반지름의 길이는

$\frac{1}{2}\overline{AB}=\frac{1}{2}\times 10=5\ (cm)$

$\therefore$ (외접원의 넓이)$=\pi\times 5^2=25\pi\ (cm^2)$

ACT 08 030~031쪽

03 $\angle PAO=90^\circ$이므로

$\angle x=180^\circ-(90^\circ+65^\circ)=25^\circ$

04 $\angle PAO=90^\circ$이므로

$\angle x=180^\circ-(90^\circ+30^\circ)=60^\circ$

05 $\triangle OAQ$에서 $\overline{OA}=\overline{OQ}$이므로

$\angle OAQ=\angle OQA=35^\circ$

$\angle OAP=90^\circ$이므로

$\angle x=90^\circ-35^\circ=55^\circ$

06 $\angle PAO=\angle PBO=90^\circ$이므로

$\angle x=360^\circ-(90^\circ+90^\circ+130^\circ)=50^\circ$

07 $\angle PAO=\angle PBO=90^\circ$이므로

$\angle x=360^\circ-(90^\circ+90^\circ+72^\circ)=108^\circ$

11 $\triangle ADI$와 $\triangle AFI$에서

$\angle ADI=\angle AFI=90^\circ$

$\overline{AI}$는 공통, $\angle DAI=\angle FAI$

$\therefore\ \triangle ADI\equiv\triangle AFI$ (RHA 합동)

13 $\triangle IEC\equiv\triangle IFC$ (RHA 합동)이므로

$\overline{EC}=\overline{FC}=6$ cm $\therefore\ x=6$

14 $\triangle AIC$에서

$\angle IAC=180^\circ-(110^\circ+25^\circ)=45^\circ$

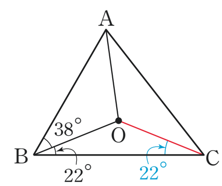
$\angle BAI=\angle CAI=45^\circ$ $\therefore\ x=45$

ACT 09 032~033쪽

02 $24^\circ+\angle x+36^\circ=90^\circ$

$\therefore\ \angle x=90^\circ-(24^\circ+36^\circ)=30^\circ$

03



$\overline{OC}$를 그으면 $\overline{OB}=\overline{OC}$이므로

$\angle OCB=\angle OBC=22^\circ$

$38^\circ+22^\circ+\angle OCA=90^\circ$이므로

$\angle OCA=90^\circ-(38^\circ+22^\circ)=30^\circ$

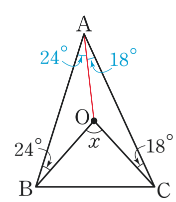
$\therefore\ \angle x=22^\circ+30^\circ=52^\circ$

05 $\triangle OBC$에서 $\overline{OB}=\overline{OC}$이므로

$\angle BOC=180^\circ-2\times 32^\circ=116^\circ$

$\therefore\ \angle x=\frac{1}{2}\angle BOC=\frac{1}{2}\times 116^\circ=58^\circ$

06



$\overline{OA}$를 그으면

$\overline{OA}=\overline{OB}$이므로 $\angle OAB=\angle OBA=24^\circ$

$\overline{OA}=\overline{OC}$이므로 $\angle OAC=\angle OCA=18^\circ$

$\therefore\ \angle BAC=24^\circ+18^\circ=42^\circ$

$\therefore\ \angle x=2\angle BAC=2\times 42^\circ=84^\circ$

08 $\angle IBC=\frac{1}{2}\times 70^\circ=35^\circ$이므로

$35^\circ+\angle x+30^\circ=90^\circ$

$\therefore\ \angle x=90^\circ-(35^\circ+30^\circ)=25^\circ$

09 $\angle ICB=\angle ICA=30^\circ$이므로

$\triangle IBC$에서

$\angle IBC=180^\circ-(110^\circ+30^\circ)=40^\circ$

$\angle x+40^\circ+30^\circ=90^\circ$

$\therefore\ \angle x=90^\circ-(40^\circ+30^\circ)=20^\circ$

11 $130° = 90° + \frac{1}{2}\angle x \qquad \therefore \angle x = 80°$

12 $\angle BIC = 90° + \frac{1}{2} \times 72° = 126°$

$\therefore \angle x = 180° - (126° + 22°) = 32°$

ACT 10 034~035쪽

02 $\triangle ABC = \frac{1}{2} \times 3 \times (8+15+17) = 60\ (\mathrm{cm}^2)$

03 $54 = \frac{1}{2} \times 3 \times (\overline{AB} + \overline{BC} + \overline{CA})$

$\therefore \overline{AB} + \overline{BC} + \overline{CA} = 36\ (\mathrm{cm})$

04 $25 = \frac{1}{2} \times 2 \times (\overline{AB} + \overline{BC} + \overline{CA})$

$\therefore \overline{AB} + \overline{BC} + \overline{CA} = 25\ (\mathrm{cm})$

06 내접원의 반지름의 길이를 r cm라고 하면

$\frac{1}{2} \times 12 \times 5 = \frac{1}{2} \times r \times (5+12+13)$

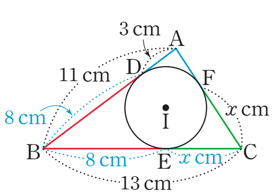
$30 = 15r \qquad \therefore r = 2$

$\therefore$ (내접원의 넓이)$= \pi \times 2^2 = 4\pi\ (\mathrm{cm}^2)$

07 $\overline{CE} = \overline{CF} = 5$ cm이므로

$\overline{BD} = \overline{BE} = 8 - 5 = 3\ (\mathrm{cm})$, 즉 $x = 3$

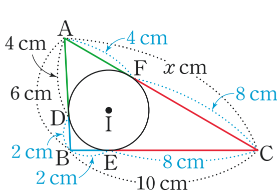
08



$\overline{BE} = \overline{BD} = 11 - 3 = 8\ (\mathrm{cm})$

$\therefore \overline{CF} = \overline{CE} = \overline{BC} - \overline{BE} = 13 - 8 = 5\ (\mathrm{cm})$, 즉 $x = 5$

09



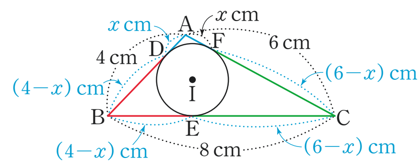
$\overline{AF} = \overline{AD} = 4$ cm

$\overline{BE} = \overline{BD} = 6 - 4 = 2\ (\mathrm{cm})$

$\overline{CF} = \overline{CE} = 10 - 2 = 8\ (\mathrm{cm})$

$\therefore \overline{AC} = \overline{AF} + \overline{FC} = 4 + 8 = 12\ (\mathrm{cm})$, 즉 $x = 12$

11



$\overline{AD} = \overline{AF} = x$ cm이므로

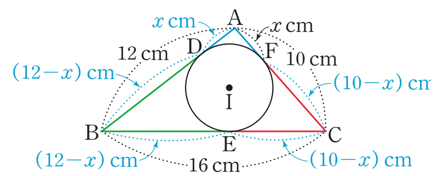
$\overline{BE} = \overline{BD} = (4 - x)$ cm

$\overline{EC} = \overline{FC} = (6 - x)$ cm

$\overline{BC} = \overline{BE} + \overline{EC} = (4 - x) + (6 - x) = 8$

$2x = 2 \qquad \therefore x = 1$

12



$\overline{AD} = \overline{AF} = x$ cm이므로

$\overline{BE} = \overline{BD} = (12 - x)$ cm

$\overline{EC} = \overline{FC} = (10 - x)$ cm

$\overline{BC} = \overline{BE} + \overline{EC} = (12 - x) + (10 - x) = 16$

$2x = 6 \qquad \therefore x = 3$

ACT+ 11 036~037쪽

02 $\overline{DI} = \overline{DB} = 5$ cm이고 $\overline{EI} = \overline{EC} = 6$ cm이므로

$\overline{DE} = \overline{DI} + \overline{IE} = 5 + 6 = 11\ (\mathrm{cm})$

03 $\overline{EI} = \overline{EC} = 3$ cm이므로

$\overline{DB} = \overline{DI} = \overline{DE} - \overline{IE} = 5 - 3 = 2\ (\mathrm{cm})$

04 $\overline{DI} = \overline{DB} = 7$ cm이므로

$\overline{CE} = \overline{IE} = \overline{DE} - \overline{DI} = 16 - 7 = 9\ (\mathrm{cm})$

05 ($\triangle ADE$의 둘레의 길이)

$= \overline{AB} + \overline{AC} = 7 + 10 = 17\ (\mathrm{cm})$

07 $\angle A = \frac{1}{2}\angle BOC = \frac{1}{2} \times 100° = 50°$

$\therefore \angle x = 90° + \frac{1}{2}\angle A$

$= 90° + \frac{1}{2} \times 50°$

$= 115°$

08 $110° = 90° + \frac{1}{2}\angle A$이므로 $\angle A = 40°$

$\therefore \angle x = 2\angle A = 2 \times 40° = 80°$

10 $\angle BOC=2\angle A=2\times 36^\circ=72^\circ$
$\triangle OBC$에서 $\overline{OB}=\overline{OC}$이므로
$\angle OBC=\frac{1}{2}\times(180^\circ-72^\circ)=54^\circ$

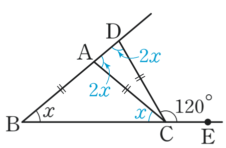
11 $\angle ABC=\frac{1}{2}\times(180^\circ-36^\circ)=72^\circ$
$\therefore\ \angle IBC=\frac{1}{2}\angle ABC=\frac{1}{2}\times 72^\circ=36^\circ$

12 $\angle OBI=\angle OBC-\angle IBC$
$=54^\circ-36^\circ=18^\circ$

TEST 01 038~039쪽

01 ① 이등변삼각형의 두 밑각의 크기는 서로 같다.
②, ④ 이등변삼각형의 꼭지각의 이등분선은 밑변을 수직이등분한다.
⑤ SAS 합동
따라서 옳지 않은 것은 ③이다.

03



$\angle ACB=\angle ABC=\angle x$
$\triangle ABC$에서
$\angle DAC=\angle x+\angle x=2\angle x$
$\angle CDA=\angle CAD=2\angle x$이므로
$\triangle DBC$에서
$\angle x+2\angle x=120^\circ$
$3\angle x=120^\circ \qquad \therefore\ \angle x=40^\circ$

04 ① RHS 합동
② SAS 합동
③, ④ RHA 합동
따라서 조건이 아닌 것은 ⑤이다.

05 $\triangle DBE\equiv\triangle CBE$ (RHS 합동)이므로
$\angle EBC=\angle EBD=\frac{1}{2}\times 48^\circ=24^\circ$
$\therefore\ \angle x=180^\circ-(90^\circ+24^\circ)=66^\circ$

06 $\triangle EBD\equiv\triangle FCD$ (RHS 합동)이므로
$\angle C=\angle B=65^\circ$
$\therefore\ \angle x=180^\circ-2\times 65^\circ=50^\circ$

07 $\triangle DBA\equiv\triangle EAC$ (RHA 합동)이므로
$\overline{DA}=\overline{EC}=4,\ \overline{AE}=\overline{BD}=6$
$\therefore\ \overline{DE}=\overline{DA}+\overline{AE}$
$=4+6=10$

08 $\overline{OA}=\overline{OB}$이므로
$\angle OAB=\angle OBA=36^\circ$
$\angle OAT=90^\circ$이므로
$\angle x=90^\circ-36^\circ=54^\circ$

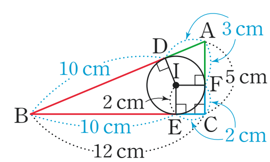
09 외접원의 반지름의 길이는
$12\times\frac{1}{2}=6$ (cm)
따라서 외접원의 넓이는
$\pi\times 6^2=36\pi$ (cm^2)

10 $38^\circ+\angle x+20^\circ=90^\circ$
$\therefore\ \angle x=90^\circ-(38^\circ+20^\circ)=32^\circ$

11 $90^\circ+\frac{1}{2}\angle x=134^\circ$
$\therefore\ \angle x=88^\circ$

12 $30=\frac{1}{2}\times 3\times(\overline{AB}+\overline{BC}+\overline{CA})$
$\therefore\ \overline{AB}+\overline{BC}+\overline{CA}=20$ (cm)

13



점 I에서 세 변에 내린 수선의 발을 각각 D, E, F라고 하면 사각형 IECF는 정사각형이므로
$\overline{EC}=\overline{FC}=2$ cm
$\overline{AD}=\overline{AF}=5-2=3$ (cm)
$\overline{BD}=\overline{BE}=12-2=10$ (cm)
$\therefore\ \overline{AB}=\overline{AD}+\overline{DB}=3+10=13$ (cm)

다른 풀이
직각삼각형의 넓이를 이용해 구할 수 있다.
$\frac{1}{2}\times 12\times 5=\frac{1}{2}\times 2\times(\overline{AB}+12+5)$
$30=\overline{AB}+17 \qquad \therefore\ \overline{AB}=13$ (cm)

14 ($\triangle ADE$의 둘레의 길이)
$=\overline{AB}+\overline{AC}=10+12=22$ (cm)

15 $\angle A=\frac{1}{2}\angle BOC=\frac{1}{2}\times 136^\circ=68^\circ$
$\therefore\ \angle x=90^\circ+\frac{1}{2}\angle A$
$=90^\circ+\frac{1}{2}\times 68^\circ$
$=124^\circ$

Chapter Ⅱ 사각형의 성질

ACT 12 044~045쪽

07 $x=10$
$y+1=7$에서 $y=6$

08 $x+8=3x-2$에서 $x=5$
$9=2y+1$에서 $y=4$

09 $\angle x=\angle B=55°$
$\angle y=180°-55°=125°$

10 $\angle x=180°-50°=130°$
$\angle y=\angle B=50°$

11 $\angle x=\angle D=75°$
$\angle DAC=\angle ACB=40°$ (엇각)이므로
$\triangle ACD$에서
$\angle y=180°-(40°+75°)=65°$

12 $\angle x=\angle BAC=45°$ (엇각)
$\angle B=\angle D=80°$이므로
$\triangle ABC$에서
$\angle y=180°-(45°+80°)=55°$

15 $x+6=13$에서 $x=7$
$2y+3=9$에서 $y=3$

16 $x=\frac{1}{2}\times 12=6$
$3y+2=\frac{1}{2}\times 10$에서 $3y+2=5$ $\therefore y=1$

ACT+ 13 046~047쪽

01 $\angle D=180°-100°=80°$이므로
$\triangle AED$에서 $\angle x=180°-(30°+80°)=70°$
다른 풀이
$\angle A=\angle C=100°$이므로 $\angle BAE=100°-30°=70°$
$\therefore \angle x=\angle BAE=70°$ (엇각)

02 $\angle D=\angle B=94°$이므로
$\triangle AED$에서 $\angle x+94°=116°$
$\therefore \angle x=116°-94°=22°$

03 $\angle B=180°-120°=60°$이므로
$\triangle ABE$에서 $\angle x=180°-(50°+60°)=70°$

04 $\angle D=\angle B=75°$이므로
$\triangle ECD$에서 $\angle x=180°-(75°+80°)=25°$

06 $\angle A+\angle B=180°$이므로 $\angle A=180°\times\frac{5}{9}=100°$
$\therefore \angle x=\angle A=100°$

07 $\angle A+\angle B=180°$이므로 $\angle B=180°\times\frac{1}{3}=60°$
$\therefore \angle x=\angle B=60°$

09 $\angle AEB=\angle EBC$ (엇각)이므로 $\angle ABE=\angle AEB$
따라서 $\triangle ABE$는 이등변삼각형이므로
$\angle AEB=\frac{1}{2}\times(180°-110°)=35°$
$\therefore \angle x=180°-35°=145°$

10 $\angle AED=\angle BAE$ (엇각)이므로 $\angle DAE=\angle AED$
따라서 $\triangle AED$는 이등변삼각형이다.
이때 $\angle D=\angle B=64°$이므로
$\angle AED=\frac{1}{2}\times(180°-64°)=58°$
$\therefore \angle x=180°-58°=122°$

12 $\angle BEC=\angle ABE$ (엇각)
이때 $\angle EBC=\angle BEC=35°$이므로
$\angle ADC=\angle ABC=2\angle EBC=2\times 35°=70°$

13 $\angle AED=\angle BAE$ (엇각)이므로 $\angle DAE=\angle AED$
따라서 $\triangle AED$는 이등변삼각형이다.
이때 $\angle D=\angle B=74°$이므로
$\angle x=\frac{1}{2}\times(180°-74°)=53°$

ACT+ 14 048~049쪽

02 $\angle AEB=\angle DAE$ (엇각)이므로 $\angle BAE=\angle AEB$
따라서 $\triangle ABE$는 이등변삼각형이므로 $\overline{BE}=\overline{AB}=7$
$\therefore x=\overline{BC}-\overline{BE}=10-7=3$

03 $\angle BEC=\angle ABE$ (엇각)이므로 $\angle EBC=\angle BEC$
따라서 $\triangle EBC$는 이등변삼각형이므로 $\overline{CE}=\overline{BC}=5$
$\therefore x=\overline{DC}-\overline{CE}=8-5=3$

05 $\angle BEC=\angle ECD$ (엇각)이므로 $\angle BEC=\angle BCE$
따라서 $\triangle EBC$는 이등변삼각형이므로 $\overline{BE}=\overline{BC}=7$
$\therefore x=\overline{BE}-\overline{AB}=7-4=3$

06 $\angle AED=\angle BAE$ (엇각)이므로 $\angle DAE=\angle AED$
따라서 $\triangle AED$는 이등변삼각형이므로 $\overline{DE}=\overline{AD}=12$
$\therefore x=\overline{DE}-\overline{DC}=12-8=4$

08 $\triangle AED \equiv \triangle FEC$ (ASA 합동)
$\overline{CF}=\overline{DA}=\overline{BC}=6$이므로
$x=\overline{BC}+\overline{CF}=6+6=12$

09 $\triangle ABE \equiv \triangle DFE$ (ASA 합동)
$\overline{FD}=\overline{BA}=\overline{CD}=4$이므로
$x=\overline{CD}+\overline{DF}=4+4=8$

11 $\angle DEC=\angle ADE$ (엇각), $\angle AFB=\angle DAF$ (엇각)이므로
$\triangle ABF$와 $\triangle DEC$는 각각 이등변삼각형이다.
$\overline{BF}=\overline{AB}=5$, $\overline{CE}=\overline{CD}=5$이므로
$x=\overline{BF}+\overline{CE}-\overline{BC}=5+5-7=3$

12 $\angle DEC=\angle ADE$ (엇각), $\angle AFB=\angle DAF$ (엇각)이므로
$\triangle ABF$와 $\triangle DEC$는 각각 이등변삼각형이다.
$\overline{BF}=\overline{AB}=8$, $\overline{CE}=\overline{CD}=8$이므로
$x=\overline{BF}+\overline{CE}-\overline{BC}=8+8-10=6$

ACT 15 050~051쪽

07 두 쌍의 대변이 각각 평행하다.

09 두 쌍의 대변의 길이가 각각 같다.

11 한 쌍의 대변이 평행하고 그 길이가 같다.

12 $\angle D=360^\circ-(70^\circ+110^\circ+70^\circ)=110^\circ$
따라서 두 쌍의 대각의 크기가 각각 같다.

13 두 쌍의 대변의 길이가 각각 같아야 하므로
$\overline{AB}=\overline{DC}=4$, $\overline{BC}=\overline{AD}=5$

14 두 쌍의 대각의 크기가 각각 같아야 하므로
$\angle B=\angle D=65^\circ$, $\angle C=\angle A=115^\circ$

15 두 대각선이 서로 다른 것을 이등분해야 하므로
$\overline{OC}=\overline{OA}=3$
$\overline{OD}=\overline{OB}=5$
$\therefore \overline{BD}=\overline{OB}+\overline{OD}=5+5=10$

16 한 쌍의 대변이 평행하고 그 길이가 같아야 하므로
$\overline{AD}=\overline{BC}=10$

17 한 쌍의 대변이 평행하고 그 길이가 같아야 하므로
$\angle B=180^\circ-\angle A=180^\circ-120^\circ=60^\circ$
$\overline{BC}=\overline{AD}=7$

ACT 17 054~055쪽

01 $\triangle ABC=\frac{1}{2}\square ABCD=\frac{1}{2}\times 52=26\ (cm^2)$

02 $\triangle BCD=\frac{1}{2}\square ABCD=\frac{1}{2}\times 52=26\ (cm^2)$

03 $\triangle AOD=\frac{1}{4}\square ABCD=\frac{1}{4}\times 52=13\ (cm^2)$

04 $\triangle ABO=\triangle AOD=8\ cm^2$

05 $\triangle ABC=2\triangle AOD=2\times 8=16\ (cm^2)$

06 $\square ABCD=4\triangle AOD=4\times 8=32\ (cm^2)$

07 $\triangle AOD=\triangle OCD=12\ cm^2$

08 $\square ABCD=4\triangle OCD=4\times 12=48\ (cm^2)$

09 $\triangle ABP+\triangle PCD=\frac{1}{2}\square ABCD=\frac{1}{2}\times 30=15\ (cm^2)$

10 $\triangle APD+\triangle PBC=\frac{1}{2}\square ABCD=\frac{1}{2}\times 30=15\ (cm^2)$

11 $\triangle PCD=\frac{1}{2}\square ABCD-\triangle ABP$
$=\frac{1}{2}\times 30-7=8\ (cm^2)$

12 $\triangle PAB+\triangle PCD=\triangle APD+\triangle PBC=13+6=19\ (cm^2)$

13 $\triangle ABP+\triangle PCD=\triangle APD+\triangle PBC$이므로
$8+9=5+\triangle PBC$
$\therefore \triangle PBC=17-5=12\ (cm^2)$

14 $\square ABCD=8\times 6=48\ (cm^2)$
$\therefore \triangle PAB=\frac{1}{2}\square ABCD-\triangle PCD$
$=\frac{1}{2}\times 48-10=14\ (cm^2)$

ACT 18 058~059쪽

02 $\overline{BD}=\overline{AC}=8\ cm$

03 $\overline{OC}=\frac{1}{2}\overline{AC}=\frac{1}{2}\times 8=4\ (cm)$

04 $\angle BDC=90^\circ-50^\circ=40^\circ$

05 $\angle DBC = \angle ADB = 50^\circ$ (엇각)

06 $x = \frac{1}{2}\overline{AC} = \frac{1}{2}\overline{BD} = \frac{1}{2} \times 10 = 5$
$\angle ODA = 90^\circ - 55^\circ = 35^\circ$이고 $\overline{OA} = \overline{OD}$이므로
$\angle OAD = \angle ODA = 35^\circ$ $\quad \therefore y = 35$

07 $x = \overline{AC} = 2\overline{OC} = 2 \times 6 = 12$
$\overline{OA} = \overline{OB}$이므로 $\triangle AOB$에서
$\angle AOB = 180^\circ - 2 \times 60^\circ = 60^\circ$
$\therefore \angle DOC = \angle AOB = 60^\circ$ (맞꼭지각)
$\therefore y = 60$

08 $x = \overline{AC} = 2\overline{AO} = 2 \times 7 = 14$
$\angle AOB = 180^\circ - 134^\circ = 46^\circ$이고
$\overline{OA} = \overline{OB}$이므로 $\triangle AOB$에서
$\angle OAB = \frac{1}{2} \times (180^\circ - 46^\circ) = 67^\circ$ $\quad \therefore y = 67$

10 $\overline{AD} = \overline{AB} = 8$ cm

11 $\overline{AC} = 2\overline{AO} = 2 \times 4 = 8$ (cm)

12 $\overline{AC} \perp \overline{BD}$이므로 $\angle AOD = 90^\circ$

13 $\triangle OBC$에서
$\angle OBC = 180^\circ - (90^\circ + 60^\circ) = 30^\circ$

14 $x = \overline{BC} = 8$
$\angle AOD = 90^\circ$이므로 $\triangle AOD$에서
$\angle ADO = 180^\circ - (90^\circ + 50^\circ) = 40^\circ$ $\quad \therefore y = 40$

15 $x = \overline{OD} = 6$
$\angle AOB = 90^\circ$이므로 $\triangle ABO$에서
$\angle ABO = 180^\circ - (90^\circ + 28^\circ) = 62^\circ$
$\overline{AB} = \overline{AD}$이므로
$\angle ADB = \angle ABD = 62^\circ$ $\quad \therefore y = 62$

16 $x = \overline{AB} = 9$
$\overline{CB} = \overline{CD}$이므로 $\angle DBC = \angle BDC = 35^\circ$
$\triangle BCD$에서 $\angle BCD = 180^\circ - 2 \times 35^\circ = 110^\circ$이므로
$\angle BAD = \angle BCD = 110^\circ$ $\quad \therefore y = 110$

ACT 19 060~061쪽

05 $\angle B + \angle D = 180^\circ$에서
$\angle B = \angle D = \frac{1}{2} \times 180^\circ = 90^\circ$
한 내각의 크기가 90°이므로 평행사변형 ABCD는 직사각형이 된다.

06 한 내각의 크기가 90°이어야 하므로
$\angle ABC = 90^\circ$ $\quad \therefore x = 90$

07 두 대각선의 길이가 같아야 하므로
$\overline{AC} = \overline{BD} = 14$ cm $\quad \therefore x = 14$

08 평행사변형이므로
$\overline{OA} = \overline{OC}$, $\overline{OB} = \overline{OD}$
두 대각선의 길이가 같아야 하므로
$\overline{OD} = \frac{1}{2}\overline{BD} = \frac{1}{2}\overline{AC} = \overline{AO} = 6$ cm
$\therefore x = 6$

09 평행사변형이므로
$\overline{OB} = \overline{OD} = 5$ cm $\quad \therefore \overline{BD} = 2 \times 5 = 10$ (cm)
두 대각선의 길이가 같아야 하므로
$\overline{AC} = \overline{BD} = 10$ cm $\quad \therefore x = 10$

14 $\angle ABD = \angle ADB$이면 $\triangle ABD$가 이등변삼각형이므로
$\overline{AB} = \overline{AD}$ ➡ 이웃하는 두 변의 길이가 같다.

15 이웃하는 두 변의 길이가 같아야 하므로
$\overline{BC} = \overline{AB} = 6$ cm $\quad \therefore x = 6$

16 두 대각선이 서로 수직이어야 하므로
$\angle AOD = 90^\circ$ $\quad \therefore x = 90$

17 이웃하는 두 변의 길이가 같아야 하므로 $\overline{AD} = \overline{DC}$
$\therefore \angle OCD = \angle OAD = 55^\circ$ $\quad \therefore x = 55$

18 두 대각선이 서로 수직이어야 하므로 $\angle AOB = 90^\circ$
$\triangle ABO$에서 $\angle ABO = 180^\circ - (90^\circ + 48^\circ) = 42^\circ$
$\therefore x = 42$

ACT 20 062~063쪽

02 $\overline{AC} = \overline{BD} = 10$ cm

03 $\overline{OC} = \frac{1}{2}\overline{AC} = \frac{1}{2}\overline{BD} = \frac{1}{2} \times 10 = 5$ (cm)

04 $\overline{AC} \perp \overline{BD}$이므로 $\angle AOD = 90^\circ$

05 $\overline{OA} = \overline{OD}$이고 $\angle AOD = 90^\circ$이므로
$\triangle AOD$에서 $\angle ADB = \frac{1}{2} \times (180^\circ - 90^\circ) = 45^\circ$

06 $x = \overline{AD} = 9$
$\angle AOD = 90^\circ$이고 $\overline{AO} = \overline{DO}$이므로
$\angle ADO = 45^\circ$ $\quad \therefore y = 45$

07 $x=\overline{BD}=2\overline{BO}=2\times6=12$
$\angle BOC=90^\circ$이므로 $y=90$

08 $x=\overline{AD}=12$
$\angle ADC=90^\circ$이고 $\overline{AD}=\overline{DC}$이므로 $\angle CAD=45^\circ$
$\triangle AED$에서 $\angle DEC=45^\circ+36^\circ=81^\circ$
$\therefore\ y=81$

10 $\overline{DC}=\overline{AB}=7$ cm

11 $\overline{BD}=\overline{AC}=12$ cm

12 $\angle BCD=\angle CBA=70^\circ$

13 $\angle ADC=180^\circ-70^\circ=110^\circ$

14 $x=\overline{DB}=9$
$\angle ABC=180^\circ-125^\circ=55^\circ$　　$\therefore\ y=55$

15 $x=\overline{AC}=\overline{AO}+\overline{OC}=4+6=10$
$\angle BCD=180^\circ-105^\circ=75^\circ$　　$\therefore\ y=75$

16 $x=\overline{DC}=\overline{AD}=9$
$\angle D=180^\circ-72^\circ=108^\circ$
$\triangle ACD$에서 $\angle DAC=\frac{1}{2}\times(180^\circ-108^\circ)=36^\circ$
$\angle ACB=\angle DAC=36^\circ$ (엇각)이므로 $y=36$

ACT 21　064~065쪽

11 이웃하는 두 변의 길이가 같아야 하므로
$\overline{AB}=\overline{BC}=5$ cm　　$\therefore\ x=5$

12 두 대각선이 서로 수직이어야 하므로
$\angle AOD=90^\circ$　　$\therefore\ x=90$

13 두 대각선의 길이가 같아야 하므로
$\overline{BD}=\overline{AC}=2\overline{AO}=2\times4=8$ (cm)　　$\therefore\ x=8$

14 한 내각의 크기가 90°이어야 하므로 $\angle B=90^\circ$
$\triangle AOB\equiv\triangle COB$ (RHS 합동)이므로
$\angle ABO=\frac{1}{2}\angle B=\frac{1}{2}\times90^\circ=45^\circ$　　$\therefore\ x=45$

15 이웃하는 두 변의 길이가 같으므로 마름모가 된다.

16 $\overline{AC}=2\overline{OA}=2\overline{OB}=\overline{BD}$
따라서 두 대각선의 길이가 같으므로 직사각형이 된다.

17 두 대각선이 서로 수직이므로 마름모가 된다.

18 $\angle A+\angle B=180^\circ$이므로 $\angle A=\angle B=\frac{1}{2}\times180^\circ=90^\circ$
따라서 한 내각의 크기가 90°이므로 직사각형이 된다.

19 $\angle OBC=\angle ODC$이므로 $\overline{BC}=\overline{DC}$
따라서 이웃하는 두 변의 길이가 같으므로 마름모가 된다.

20 한 내각의 크기가 90°이므로 직사각형이 되고, 직사각형의 두 대각선이 서로 수직이므로 정사각형이 된다.

21 이웃하는 두 변의 길이가 같으므로 마름모가 되고, 마름모의 두 대각선의 길이가 같으므로 정사각형이 된다.

ACT 22　066~067쪽

04 정사각형은 직사각형이다.

06 한 내각의 크기가 90°인 평행사변형은 직사각형이다.

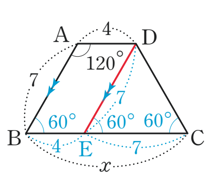
11 평행사변형 ➡ 평행사변형

13 마름모 ➡ 직사각형

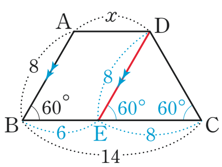
ACT+ 23　068~069쪽

02 $\triangle ABP\equiv\triangle ADP$ (SAS 합동)이므로
$\angle ABP=\angle ADP=40^\circ$
이때 $\angle BAP=\angle DAP=\frac{1}{2}\times90^\circ=45^\circ$이므로
$\triangle ABP$에서 $\angle x=45^\circ+40^\circ=85^\circ$

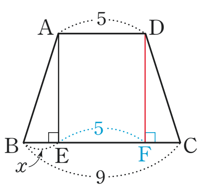
04 $\triangle ABE\equiv\triangle BCF$ (SAS 합동)이므로
$\angle BFC=\angle AEB=55^\circ$
$\triangle BCF$에서 $\angle x=180^\circ-(90^\circ+55^\circ)=35^\circ$

06


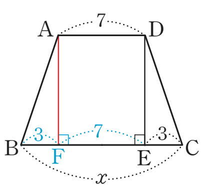
점 D를 지나고 $\overline{AB}$와 평행한 $\overline{DE}$를 그으면
$\angle B=180^\circ-120^\circ=60^\circ$이므로
$\angle DEC=\angle B=60^\circ$ (동위각)
$\angle C=\angle B=60^\circ$이므로 $\triangle DEC$는 정삼각형이다.
이때 □ABED는 평행사변형이므로
$\overline{BE}=\overline{AD}=4$, $\overline{EC}=\overline{DE}=\overline{AB}=7$
$\therefore\ x=\overline{BE}+\overline{EC}=4+7=11$

07


점 D를 지나고 $\overline{AB}$와 평행한 $\overline{DE}$를 그으면
$\angle DEC = \angle B = 60°$ (동위각)
$\angle C = \angle B = 60°$이므로 $\triangle DEC$는 정삼각형이다.
이때 $\square ABED$는 평행사변형이므로
$\overline{EC} = \overline{DE} = \overline{AB} = 8$
$\overline{BE} = \overline{BC} - \overline{EC} = 14 - 8 = 6$
$\therefore x = \overline{BE} = 6$

09


$\triangle ABE \equiv \triangle DCF$ (RHA 합동)이므로
$\overline{BE} = \overline{CF}$
$\overline{EF} = \overline{AD} = 5$이므로
$x = \frac{1}{2} \times (9-5) = 2$

10


$\triangle ABF \equiv \triangle DCE$ (RHA 합동)이므로
$\overline{BF} = \overline{CE} = 3$
$\overline{FE} = \overline{AD} = 7$이므로
$x = \overline{BF} + \overline{FE} + \overline{EC}$
$= 3 + 7 + 3 = 13$

ACT 24 070~071쪽

03 $\triangle ABO = \triangle ABC - \triangle OBC$
$= \triangle DBC - \triangle OBC$
$= \triangle DCO$

05 $\square ABCD = \triangle ABC + \triangle ACD$
$= \triangle ABC + \triangle ACE$
$= \triangle ABE$

06 $\triangle DOC = \triangle ACD - \triangle AOD$
$= \triangle ABD - \triangle AOD$
$= 20 - 5 = 15\ (\text{cm}^2)$

07 $\triangle ABD = \triangle ACD$
$= \triangle DOC + \triangle AOD$
$= 10 + 7 = 17\ (\text{cm}^2)$

08 $\triangle ABO = \triangle ABC - \triangle OBC$
$= \triangle DBC - \triangle OBC = \triangle DOC$
$\triangle OBC = \triangle ABC - \triangle ABO$
$= \triangle ABC - \triangle DOC$
$= 15 - 6 = 9\ (\text{cm}^2)$

10 $\triangle ABE = \triangle ABC + \triangle ACE$
$= \triangle ABC + \triangle ACD$
$= \square ABCD = 20\ \text{cm}^2$

11 $\triangle ABC = \triangle ABE - \triangle ACE$
$= \triangle ABE - \triangle ACD$
$= 18 - 8 = 10\ (\text{cm}^2)$

12 $\triangle ACE = \triangle ACD$
$= \square ABCD - \triangle ABC$
$= 35 - 12 = 23\ (\text{cm}^2)$

14 $\square ABCD = \triangle ABD + \triangle DBC$
$= \triangle DEB + \triangle DBC$
$= \triangle DEC$
$= \frac{1}{2} \times (2+6) \times 5 = 20\ (\text{cm}^2)$

15 $\square ABCD = \triangle ABC + \triangle ACD$
$= \triangle ABC + \triangle ACE$
$= \triangle ABE$
$= \frac{1}{2} \times (6+8) \times 7 = 49\ (\text{cm}^2)$

16 $\square ABCD = \triangle ABD + \triangle DBC$
$= \triangle DEB + \triangle DBC$
$= \triangle DEC$
$= \frac{1}{2} \times (6+4) \times 5 = 25\ (\text{cm}^2)$

ACT 25 072~073쪽

02 $\triangle ADC = \frac{1}{3} \triangle ABC$
$= \frac{1}{3} \times 30 = 10\ (\text{cm}^2)$

03 $\triangle ABD=\frac{1}{2}\triangle ABC$
$=\frac{1}{2}\times 30=15\ (cm^2)$
$\therefore\ \triangle ABE=\frac{2}{3}\triangle ABD$
$=\frac{2}{3}\times 15=10\ (cm^2)$

04 $\triangle ABE=\frac{3}{5}\triangle ABC$
$=\frac{3}{5}\times\left(\frac{1}{2}\square ABCD\right)$
$=\frac{3}{10}\square ABCD$
$=\frac{3}{10}\times 60=18\ (cm^2)$

05 $\triangle DBE=\frac{2}{3}\triangle DBC$
$=\frac{2}{3}\times\left(\frac{1}{2}\square ABCD\right)$
$=\frac{1}{3}\square ABCD$
$=\frac{1}{3}\times 60=20\ (cm^2)$

07 $\triangle OBC:\triangle DOC=3:2$이므로
$30:\triangle DOC=3:2$
$\therefore\ \triangle DOC=20\ (cm^2)$
$\therefore\ \triangle ABC=\triangle DBC$
$=\triangle DOC+\triangle OBC$
$=20+30=50\ (cm^2)$

08 $\triangle AOD:\triangle DOC=2:3$이므로
$6:\triangle DOC=2:3$
$\therefore\ \triangle DOC=9\ (cm^2)$
$\therefore\ \triangle ABD=\triangle ACD$
$=\triangle AOD+\triangle DOC$
$=6+9=15\ (cm^2)$

09 $\triangle DOC=\triangle ABO=9\ cm^2$이고
$\triangle OBC:\triangle DOC=2:1$이므로
$\triangle OBC:9=2:1$
$\therefore\ \triangle OBC=18\ (cm^2)$
$\therefore\ \triangle DBC=\triangle DOC+\triangle OBC$
$=9+18=27\ (cm^2)$

10 $\triangle ABO=\frac{2}{5}\triangle ABC$
$=\frac{2}{5}\times 35=14\ (cm^2)$
$\therefore\ \triangle DOC=\triangle ABO=14\ cm^2$

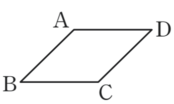
11 $\triangle AOD:\triangle AOB=1:2$이므로
$4:\triangle AOB=1:2$
$\therefore\ \triangle AOB=8\ (cm^2)$
또한 $\triangle DOC:\triangle OBC=1:2$이고
$\triangle DOC=\triangle AOB=8\ cm^2$이므로
$8:\triangle OBC=1:2$
$\therefore\ \triangle OBC=16\ (cm^2)$

TEST 02

074~075쪽

01 $x=2\times 6=12$
$\angle ABC=\angle ADC$
$=180°-(40°+60°)=80°$
$\therefore\ y=80$

02



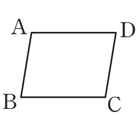
$\angle A+\angle B=180°$이므로
$3\angle B+\angle B=180°\qquad\therefore\ \angle B=45°$
$\therefore\ \angle D=\angle B=45°$

03 $\angle BEA=\angle DAE$ (엇각)이므로 $\angle BAE=\angle BEA$
따라서 $\triangle ABE$는 이등변삼각형이므로
$\overline{BE}=\overline{AB}=6$
$\therefore\ x=\overline{BC}-\overline{BE}=\overline{AD}-\overline{BE}=10-6=4$

04 $\triangle ABE\equiv\triangle DFE$ (ASA 합동)
$\overline{DF}=\overline{AB}=5$이므로
$\overline{CF}=\overline{CD}+\overline{DF}=5+5=10$

05 (1) 두 쌍의 대변이 각각 평행해야 하므로
$\angle DAC=\angle ACB=35°$ (엇각) $\qquad\therefore\ x=35$
$\angle BDC=\angle ABD=55°$ (엇각) $\qquad\therefore\ y=55$
(2) 두 대각선이 서로 다른 것을 이등분해야 하므로
$x=\overline{OD}=6$
$y=\frac{1}{2}\overline{AC}=\frac{1}{2}\times 10=5$

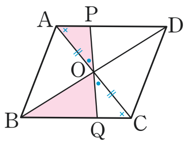
06



② $\angle A=\angle C=100°$, $\angle B=\angle D=80°$
즉, 두 쌍의 대각의 크기가 각각 같으므로 평행사변형이다.
⑤ $\angle A+\angle B=180°$에서 $\overline{AD}/\!/\overline{BC}$이고, $\overline{AD}=\overline{BC}$
즉, 한 쌍의 대변이 평행하고 그 길이가 같으므로 평행사변형이다.
따라서 옳은 것은 ②, ⑤이다.

07 $\overline{OA}=\overline{OC}$이고 $\overline{AE}=\overline{CG}$이므로
$\overline{OE}=\overline{OG}$ ...... ㉠
또한 $\overline{OB}=\overline{OD}$이고 $\overline{BF}=\overline{DH}$이므로
$\overline{OF}=\overline{OH}$ ...... ㉡
㉠, ㉡에서 $\square EFGH$는 두 대각선이 서로 다른 것을 이등분하므로 평행사변형이다.

08



$\triangle AOP \equiv \triangle COQ$ (ASA 합동)이므로

$\triangle AOP = \triangle COQ$

$\therefore \triangle AOP + \triangle BOQ$

$= \triangle COQ + \triangle BOQ$

$= \triangle OBC$

$= \frac{1}{4} \square ABCD$

$= \frac{1}{4} \times 40$

$= 10\ (cm^2)$

10 ① $\overline{AB} = \overline{DC} = 5$ cm

② $\overline{BD} = \overline{AC} = 8$ cm

③ $\angle ADC = 180° - 70° = 110°$

④ $\angle BCD = \angle ABC = 70°$

⑤ $\triangle ABC$와 $\triangle DCB$에서

$\overline{AB} = \overline{DC}$, $\overline{BC}$는 공통

$\angle ABC = \angle DCB$

$\therefore \triangle ABC \equiv \triangle DCB$ (SAS 합동)

따라서 옳지 않은 것은 ③이다.

11 $\angle AOD = 90°$이므로 $\square ABCD$는 마름모가 된다.

$\therefore \overline{AB} = \overline{AD} = 6$ cm

12 $\overline{AB} /\!/ \overline{DC}$, $\overline{AD} /\!/ \overline{BC}$에서 $\square ABCD$는 평행사변형이다.

이때 $\overline{AB} = \overline{AD}$에 의해 마름모가 되고, $\angle A = 90°$에 의해 정사각형이 된다.

13 ① 정사각형은 직사각형이다.

② 한 내각의 크기가 90°인 평행사변형은 직사각형이다.

⑤ 두 대각선의 길이가 같은 사각형은 정사각형, 등변사다리꼴일 수도 있다.

따라서 옳은 것은 ③, ④이다.

14 $\triangle ABO$

$= \triangle ABD - \triangle AOD$

$= \triangle ACD - \triangle AOD$

$= 14 - 6$

$= 8\ (cm^2)$

15 $\square ABCD$

$= \triangle ABC + \triangle ACD$

$= \triangle ABC + \triangle ACE$

$= \triangle ABE$

$= \frac{1}{2} \times (3+4) \times 5$

$= \frac{35}{2}\ (cm^2)$

Chapter Ⅲ 도형의 닮음

ACT 26 080~081쪽

14 $\overline{FG} : \overline{F'G'} = 4 : 6 = 2 : 3$

15 $\overline{DH} : \overline{D'H'} = 2 : 3$이므로

$\overline{DH} : 9 = 2 : 3$

$\therefore \overline{DH} = 6\ (cm)$

16 $\overline{GH} : \overline{G'H'} = 2 : 3$이므로

$2 : \overline{G'H'} = 2 : 3$

$\therefore \overline{G'H'} = 3\ (cm)$

ACT 27 082~083쪽

01 $\overline{BC} : \overline{EF} = 6 : 9 = 2 : 3$

03 $\overline{AD} : \overline{EH} = 3 : 5$

04 $3^2 : 5^2 = 9 : 25$

06 $2^2 : 5^2 = 4 : 25$

07 닮음비는 $4 : 6 = 2 : 3$이므로

둘레의 길이의 비는 $2 : 3$

08 $2^2 : 3^2 = 4 : 9$

09 $\overline{BC} : \overline{EF} = 6 : 8 = 3 : 4$

10 $3^2 : 4^2 = 9 : 16$

12 $\overline{BC} : \overline{FG} = 4 : 6 = 2 : 3$

14 $\square ABCD$의 둘레의 길이를 x cm라고 하면

$x : 24 = 2 : 3 \qquad \therefore x = 16$

16 원 O의 둘레의 길이를 x cm라고 하면

$x : 18\pi = 1 : 2 \qquad \therefore x = 9\pi$

17 $6 : 10 = 3 : 5$

18 $3^2 : 5^2 = 9 : 25$

19 부채꼴 S'의 넓이를 $x\ cm^2$라고 하면

$27\pi : x = 9 : 25 \qquad \therefore x = 75\pi$

ACT 28 084~085쪽

01 $4:6=2:3$

02 $2^2:3^2=4:9$

03 $12:18=2:3$

04 $2^3:3^3=8:27$

05 $3^2:5^2=9:25$

06 $3^3:5^3=27:125$

07 닮음비는 $4:10=2:5$이므로
겉넓이의 비는 $2^2:5^2=4:25$

08 $2^3:5^3=8:125$

10 $5^2:3^2=25:9$

11 삼각기둥 B의 겉넓이를 x cm^2라고 하면
$100:x=25:9$ $\quad\therefore x=36$

12 $12:16=3:4$

14 $3^3:4^3=27:64$

15 원기둥 A의 부피를 x cm^3라고 하면
$x:192\pi=27:64$ $\quad\therefore x=81\pi$

16 $2^2:1^2=4:1$

17 구 O의 겉넓이를 x cm^2라고 하면
$x:4\pi=4:1$ $\quad\therefore x=16\pi$

18 닮음비는 $12:4=3:1$이므로
부피의 비는 $3^3:1^3=27:1$

19 물의 부피를 x cm^3라고 하면
$108\pi:x=27:1$ $\quad\therefore x=4\pi$

ACT 29 086~087쪽

04 $\triangle$JKL과 $\triangle$ONM에서
$\overline{JK}:\overline{ON}=\overline{JL}:\overline{OM}=2:3$
$\angle KJL=\angle NOM=110°$
$\therefore \triangle JKL \backsim \triangle ONM$ (SAS 닮음)

05 $\triangle$ABC와 $\triangle$PRQ에서
$\overline{AB}:\overline{PR}=\overline{BC}:\overline{RQ}=\overline{AC}:\overline{PQ}=2:1$
$\therefore \triangle ABC \backsim \triangle PRQ$ (SSS 닮음)

06 $\triangle$DEF에서 $\angle D=180°-(30°+80°)=70°$이므로
$\triangle$DEF와 $\triangle$TUS에서
$\angle D=\angle T=70°$, $\angle E=\angle U=30°$
$\therefore \triangle DEF \backsim \triangle TUS$ (AA 닮음)

07 $\triangle$GHI와 $\triangle$VXW에서
$\overline{GH}:\overline{VX}=\overline{IH}:\overline{WX}=1:2$
$\angle GHI=\angle VXW=125°$
$\therefore \triangle GHI \backsim \triangle VXW$ (SAS 닮음)

08 $\overline{AB}:\overline{DE}=\overline{BC}:\overline{EF}=\overline{AC}:\overline{DF}=1:2$
$\therefore \triangle ABC \backsim \triangle DEF$ (SSS 닮음)

09 $\triangle$DEF에서 $\angle E=180°-(45°+75°)=60°$
$\overline{AB}:\overline{DE}=\overline{BC}:\overline{EF}=1:2$, $\angle B=\angle E$
$\therefore \triangle ABC \backsim \triangle DEF$ (SAS 닮음)

11 $\triangle$ABC와 $\triangle$ACD에서
$\overline{AB}:\overline{AC}=\overline{BC}:\overline{CD}=\overline{AC}:\overline{AD}=2:1$
$\therefore \triangle ABC \backsim \triangle ACD$ (SSS 닮음)

12 $\triangle$ABC와 $\triangle$ADE에서
$\overline{AB}:\overline{AD}=\overline{AC}:\overline{AE}=1:3$
$\angle BAC=\angle DAE$ (맞꼭지각)
$\therefore \triangle ABC \backsim \triangle ADE$ (SAS 닮음)

13 $\triangle$ABC와 $\triangle$AED에서
$\angle A$는 공통, $\angle ABC=\angle AED$
$\therefore \triangle ABC \backsim \triangle AED$ (AA 닮음)

ACT+ 30 088~089쪽

02 $\triangle$ABC와 $\triangle$DEC에서
$\overline{AC}:\overline{DC}=\overline{BC}:\overline{EC}=2:3$
$\angle BCA=\angle ECD$ (맞꼭지각)
$\therefore \triangle ABC \backsim \triangle DEC$ (SAS 닮음)
닮음비는 $2:3$이므로
$\overline{AB}:\overline{DE}=2:3$에서
$8:x=2:3$ $\quad\therefore x=12$

03 $\triangle$ABC와 $\triangle$ADE에서
$\overline{AB}:\overline{AD}=\overline{AC}:\overline{AE}=3:1$, $\angle A$는 공통
$\therefore \triangle ABC \backsim \triangle ADE$ (SAS 닮음)
닮음비는 $3:1$이므로
$\overline{BC}:\overline{DE}=3:1$에서
$x:4=3:1$ $\quad\therefore x=12$

05 $\triangle ABC$와 $\triangle AED$에서
$\angle A$는 공통, $\angle ACB=\angle ADE$
$\therefore\ \triangle ABC \backsim \triangle AED$ (AA 닮음)
닮음비는 $\overline{AC}:\overline{AD}=15:9=5:3$이므로
$\overline{AB}:\overline{AE}=5:3$에서
$10:x=5:3\qquad \therefore\ x=6$

06 $\triangle ABC$와 $\triangle EBD$에서
$\angle B$는 공통, $\angle BAC=\angle BED$
$\therefore\ \triangle ABC \backsim \triangle EBD$ (AA 닮음)
닮음비는 $\overline{BC}:\overline{BD}=10:5=2:1$이므로
$\overline{AB}:\overline{EB}=2:1$에서
$(x+5):4=2:1\qquad \therefore\ x=3$

08 $\triangle ABC \backsim \triangle ADE$ (AA 닮음)이고
닮음비는 $\overline{AC}:\overline{AE}=20:8=5:2$이므로
넓이의 비는 $5^2:2^2=25:4$
$75:\triangle ADE=25:4\qquad \therefore\ \triangle ADE=12\ (\text{cm}^2)$

09 $\triangle ABC \backsim \triangle DBE$ (AA 닮음)이고
닮음비는 $\overline{BC}:\overline{BE}=15:10=3:2$이므로
넓이의 비는 $3^2:2^2=9:4$
$\triangle ABC:16=9:4\qquad \therefore\ \triangle ABC=36\ (\text{cm}^2)$

10 $\triangle ABC \backsim \triangle DBE$ (AA 닮음)이고
닮음비는 $\overline{BC}:\overline{BE}=12:9=4:3$이므로
넓이의 비는 $4^2:3^2=16:9$
$80:\triangle DBE=16:9\qquad \therefore\ \triangle DBE=45\ (\text{cm}^2)$
$\therefore\ \square ADEC=\triangle ABC-\triangle DBE$
$=80-45=35\ (\text{cm}^2)$

11 $\triangle AOD$와 $\triangle COB$에서
$\angle AOD=\angle COB$ (맞꼭지각)
$\angle DAO=\angle BCO$ (엇각)
$\therefore\ \triangle AOD \backsim \triangle COB$ (AA 닮음)
닮음비는 $\overline{AD}:\overline{CB}=4:8=1:2$이므로
넓이의 비는 $1^2:2^2=1:4$
$5:\triangle OBC=1:4\qquad \therefore\ \triangle OBC=20\ (\text{cm}^2)$

12 $\triangle AOD \backsim \triangle COB$ (AA 닮음)이고
닮음비는 $\overline{AD}:\overline{CB}=6:9=2:3$이므로
넓이의 비는 $2^2:3^2=4:9$
$\triangle AOD:45=4:9\qquad \therefore\ \triangle AOD=20\ (\text{cm}^2)$

ACT 31 090~091쪽

04 $\overline{AB}^2=\overline{BH}\times\overline{BC}$이므로 $x^2=4\times(4+5)=36$
$\therefore\ x=6\ (\because\ x>0)$

05 $\overline{AH}^2=\overline{HB}\times\overline{HC}$이므로 $12^2=16\times x\qquad \therefore\ x=9$

06 $\overline{AB}\times\overline{AC}=\overline{AH}\times\overline{BC}$이므로 $6\times 8=10\times x\qquad \therefore\ x=\frac{24}{5}$

07 $\overline{AB}^2=\overline{BH}\times\overline{BC}$이므로 $6^2=(10-x)\times 10$
$36=100-10x,\ 10x=64$
$\therefore\ x=\frac{32}{5}$

08 $\overline{AC}^2=\overline{CH}\times\overline{CB}$이므로 $5^2=4\times\overline{CB}$에서 $\overline{CB}=\frac{25}{4}$
또한 $\overline{AH}^2=\overline{HB}\times\overline{HC}$이므로
$x^2=\left(\frac{25}{4}-4\right)\times 4=9\qquad \therefore\ x=3\ (\because\ x>0)$

09 $\overline{AC}^2=\overline{CH}\times\overline{CB}$이므로 $10^2=6\times\overline{CB}$에서 $\overline{CB}=\frac{50}{3}$
또한 $\overline{AB}^2=\overline{BH}\times\overline{BC}$이므로
$x^2=\left(\frac{50}{3}-6\right)\times\frac{50}{3}=\frac{1600}{9}$
$\therefore\ x=\frac{40}{3}\ (\because\ x>0)$

ACT 32 092~093쪽

04 $4\text{ cm}\div\frac{1}{50000}=4\text{ cm}\times 50000=200000\text{ cm}=2\text{ km}$

05 $4\text{ km}\times\frac{1}{50000}=400000\text{ cm}\times\frac{1}{50000}=8\text{ cm}$

06 $(\text{축척})=\frac{2\text{ cm}}{40\text{ m}}=\frac{2\text{ cm}}{4000\text{ cm}}=\frac{1}{2000}$
$\therefore\ (\text{실제 거리})=3.6\text{ cm}\div\frac{1}{2000}$
$=3.6\text{ cm}\times 2000$
$=7200\text{ cm}=72\text{ m}$

07 $(\text{축척})=\frac{\overline{B'C'}}{\overline{BC}}=\frac{5\text{ cm}}{10\text{ m}}=\frac{5\text{ cm}}{1000\text{ cm}}=\frac{1}{200}$
$\therefore\ \overline{AC}=3.5\text{ cm}\div\frac{1}{200}=3.5\text{ cm}\times 200$
$=700\text{ cm}=7\text{ m}$
따라서 실제 나무의 높이는 $7+1.5=8.5\ (\text{m})$

08 $\triangle ABC$와 $\triangle DEC$에서
$\angle ABC=\angle DEC$
$\angle ACB=\angle DCE$ (맞꼭지각)
$\therefore\ \triangle ABC \backsim \triangle DEC$ (AA 닮음)
닮음비는 $\overline{BC}:\overline{EC}=100:40=5:2$이므로
$\overline{AB}:\overline{DE}=5:2$에서
$\overline{AB}:60=5:2\qquad \therefore\ \overline{AB}=150\ (\text{m})$
따라서 강의 폭은 150 m이다.

09 $\triangle ABC$와 $\triangle DBE$에서
$\angle B$는 공통, $\angle BCA=\angle BED$
$\therefore \triangle ABC \backsim \triangle DBE$ (AA 닮음)
닮음비는 $\overline{BC}:\overline{BE}=(0.8+5.6):0.8=8:1$이므로
$\overline{AC}:\overline{DE}=8:1$에서
$\overline{AC}:1.6=8:1 \quad \therefore \overline{AC}=12.8$ (m)
따라서 탑의 높이는 12.8 m이다.

ACT+ 33 094~095쪽

02 $\triangle ABE \backsim \triangle ACD$ (AA 닮음)이므로
$\overline{AB}:\overline{AC}=\overline{BE}:\overline{CD}$
$6:5=5:x \quad \therefore x=\frac{25}{6}$

03 $\triangle ABE \backsim \triangle ACD$ (AA 닮음)이므로
$\overline{AB}:\overline{AC}=\overline{AE}:\overline{AD}$
$16:x=8:10 \quad \therefore x=20$

04 $\triangle ACD \backsim \triangle BCE$ (AA 닮음)이므로
$\overline{AC}:\overline{BC}=\overline{CD}:\overline{CE}$
$16:(x+8)=8:12$
$8x+64=192,\ 8x=128 \quad \therefore x=16$

05 $\triangle ABE \backsim \triangle CBD$ (AA 닮음)이므로
$\overline{AB}:\overline{CB}=\overline{BE}:\overline{BD}$
$14:x=7:5 \quad \therefore x=10$

06 $\triangle BCD \backsim \triangle ACF$ (AA 닮음)이므로
$\overline{BC}:\overline{AC}=\overline{DC}:\overline{FC}$
$12:14=6:(12-x)$
$144-12x=84,\ 12x=60 \quad \therefore x=5$

07 $\triangle ABC \backsim \triangle FBD$ (AA 닮음)이므로
$\overline{AB}:\overline{FB}=\overline{BC}:\overline{BD}$
$(x+6):10=5:6$
$6x+36=50,\ 6x=14 \quad \therefore x=\frac{7}{3}$

09 $\triangle ABF \backsim \triangle DFE$ (AA 닮음)
$\overline{AB}:\overline{DF}=\overline{AF}:\overline{DE}$에서
$8:x=6:3 \quad \therefore x=4$

10 $\triangle AEF \backsim \triangle DFC$ (AA 닮음)
$\overline{AF}:\overline{DC}=\overline{EF}:\overline{FC}$에서
$\overline{EF}=\overline{BE}=\overline{AB}-\overline{AE}=9-4=5$이므로
$3:9=5:x \quad \therefore x=15$

12 $\triangle BDE \backsim \triangle CEF$ (AA 닮음)
$\overline{BE}:\overline{CF}=\overline{DE}:\overline{EF}$에서
$\overline{EF}=\overline{AF}=7$이고
$\overline{CF}=\overline{AC}-\overline{AF}=15-7=8$이므로
$10:8=x:7 \quad \therefore x=\frac{35}{4}$

13 $\triangle ADF \backsim \triangle CFE$ (AA 닮음)
$\overline{AD}:\overline{CF}=\overline{DF}:\overline{FE}$에서
$\overline{DF}=\overline{BD}=\overline{AB}-\overline{AD}=27-14=13$이므로
$14:24=13:x \quad \therefore x=\frac{156}{7}$

TEST 03 096~097쪽

02 ①, ⑤ 닮음비는 $\overline{BC}:\overline{EF}=4:6=2:3$이므로
$\overline{AB}:\overline{DE}=2:3$
② $\angle C=\angle F=40^\circ$
③ $\angle D=\angle A=85^\circ$이므로 $\angle E=180^\circ-(85^\circ+40^\circ)=55^\circ$
④ $\overline{AC}:5=2:3$이므로 $\overline{AC}=\frac{10}{3}$ (cm)
따라서 옳지 않은 것은 ④이다.

03 닮음비는 $\overline{DC}:\overline{HG}=8:4=2:1$이므로
$6:x=2:1 \quad \therefore x=3$
또한 $\angle F=\angle B=80^\circ$, $\angle G=\angle C=75^\circ$이므로
$\angle H=360^\circ-(110^\circ+80^\circ+75^\circ)=95^\circ$
$\therefore y=95$
$\therefore x+y=3+95=98$

04 닮음비는 $\overline{FG}:\overline{F'G'}=8:12=2:3$이므로
$x:9=2:3 \quad \therefore x=6$
$4:y=2:3 \quad \therefore y=6$
$\therefore x+y=6+6=12$

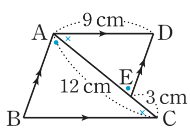
05 닮음비는 $\overline{AB}:\overline{DE}=12:9=4:3$이고
$\triangle ABC$의 둘레의 길이는
$12+16+8=36$ (cm)
$\triangle DEF$의 둘레의 길이를 x cm라고 하면
$36:x=4:3 \quad \therefore x=27$
따라서 $\triangle DEF$의 둘레의 길이는 27 cm이다.

06 닮음비는 $6:9=2:3$이므로 부피의 비는
$2^3:3^3=8:27$
원기둥 A의 부피는 $\pi\times4^2\times6=96\pi$ (cm^3)
원기둥 B의 부피를 x cm^3라고 하면
$96\pi:x=8:27 \quad \therefore x=324\pi$
따라서 원기둥 B의 부피는 324π cm^3이다.

08 $\triangle ABC \backsim \triangle DEC$ (SAS 닮음)이고
닮음비는 $\overline{AC}:\overline{DC}=3:6=1:2$이므로
$\overline{AB}:\overline{DE}=1:2$에서
$6:x=1:2$ $\therefore x=12$

09 $\triangle ABC \backsim \triangle EBD$ (SAS 닮음)이고
닮음비는 $\overline{AB}:\overline{EB}=12:8=3:2$이므로
$\overline{AC}:\overline{ED}=3:2$에서
$x:6=3:2$ $\therefore x=9$

10 $\triangle ABC \backsim \triangle DAC$ (AA 닮음)이고
닮음비는 $\overline{BC}:\overline{AC}=10:6=5:3$이므로
$\overline{AC}:\overline{DC}=5:3$에서
$6:x=5:3$ $\therefore x=\frac{18}{5}$

11


$\triangle ABC \backsim \triangle EDA$ (AA 닮음)이고
닮음비는 $\overline{AC}:\overline{EA}=12:(12-3)=4:3$이므로
$\overline{BC}:\overline{DA}=4:3$에서
$\overline{BC}:9=4:3$ $\therefore \overline{BC}=12$ (cm)

12 $\triangle ABC \backsim \triangle DEC$ (AA 닮음)이고
닮음비는 $\overline{AB}:\overline{DE}=2:1$이므로
$\overline{BC}:\overline{EC}=2:1$에서
$12:\overline{EC}=2:1$ $\therefore \overline{EC}=6$ (cm)

13 ④ $\overline{AH}^2=\overline{HB}\times\overline{HC}$

14 $\overline{AH}^2=\overline{HB}\times\overline{HC}$이므로 $12^2=x\times16$ $\therefore x=9$
또한 $\overline{AC}^2=\overline{CH}\times\overline{CB}$이므로
$y^2=16\times(16+9)=400$ $\therefore y=20$ ($\because y>0$)
$\therefore y-x=20-9=11$

15 $\triangle ABF \backsim \triangle DFE$ (AA 닮음)
$\overline{AB}:\overline{DF}=\overline{BF}:\overline{FE}$에서
$\overline{FE}=\overline{EC}=\overline{DC}-\overline{DE}=16-6=10$ (cm)이므로
$16:8=\overline{BF}:10$ $\therefore \overline{BF}=20$ (cm)

ACT 34 100~101쪽

03 $2:6=x:12$에서 $6x=24$ $\therefore x=4$

04 $6:(6+3)=x:12$에서 $9x=72$ $\therefore x=8$

05 $4:(4+x)=8:14$에서 $32+8x=56$
$8x=24$ $\therefore x=3$

06 $12:8=x:6$에서 $8x=72$ $\therefore x=9$

07 $3:4=6:x$에서 $3x=24$ $\therefore x=8$

08 $4:8\neq5:9$이므로 $\overline{BC}$와 $\overline{DE}$는 평행하지 않다.

09 $6:2=9:3$이므로 $\overline{BC}/\!/\overline{DE}$

10 $4:6\neq3:9$이므로 $\overline{BC}$와 $\overline{DE}$는 평행하지 않다.

11 $10:(10+6)=15:24$이므로 $\overline{BC}/\!/\overline{DE}$

ACT 35 102~103쪽

02 $6:x=3:5$에서 $3x=30$ $\therefore x=10$

03 $x:12=5:(15-5)$에서 $10x=60$ $\therefore x=6$

04 $10:x=(8-3):3$에서 $5x=30$ $\therefore x=6$

05 $8:10=4:(x-4)$에서 $8x-32=40$
$8x=72$ $\therefore x=9$

06 $12:8=(10-x):x$에서 $80-8x=12x$
$20x=80$ $\therefore x=4$

08 $5:3=15:x$에서 $5x=45$ $\therefore x=9$

09 $8:x=16:(16-4)$에서 $16x=96$ $\therefore x=6$

10 $x:6=(3+9):9$에서 $9x=72$ $\therefore x=8$

11 $6:3=(x+4):4$에서 $3x+12=24$
$3x=12$ $\therefore x=4$

12 $8:5=(6+x):x$에서 $30+5x=8x$
$3x=30$ $\therefore x=10$

ACT 36 104~105쪽

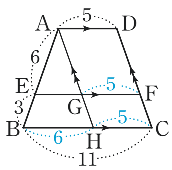
02 $x:4=(9-3):3$에서 $3x=24$ $\therefore x=8$

03 $(x-6):6=4:8$에서 $8x-48=24$
$8x=72$ $\therefore x=9$

05 $4:x=6:15$에서 $6x=60$ $\quad\therefore x=10$

06 $3:(3+2)=4:x$에서 $3x=20$ $\quad\therefore x=\dfrac{20}{3}$

07

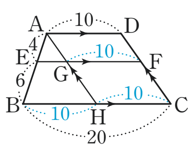


(1) $\triangle$ABH에서 $6:(6+3)=\overline{EG}:6$

$9\overline{EG}=36$ $\quad\therefore \overline{EG}=4$

(2) $\overline{EF}=\overline{EG}+\overline{GF}=4+5=9$

08

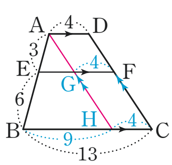


(1) $\triangle$ABH에서 $4:(4+6)=\overline{EG}:10$

$10\overline{EG}=40$ $\quad\therefore \overline{EG}=4$

(2) $\overline{EF}=\overline{EG}+\overline{GF}=4+10=14$

09

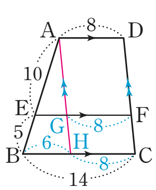


$\triangle$ABH에서 $3:(3+6)=\overline{EG}:9$

$9\overline{EG}=27$ $\quad\therefore \overline{EG}=3$

$\therefore \overline{EF}=\overline{EG}+\overline{GF}=3+4=7$

10

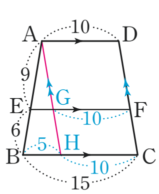


$\triangle$ABH에서 $10:(10+5)=\overline{EG}:6$

$15\overline{EG}=60$ $\quad\therefore \overline{EG}=4$

$\therefore \overline{EF}=\overline{EG}+\overline{GF}=4+8=12$

11



$\triangle$ABH에서 $9:(9+6)=\overline{EG}:5$

$15\overline{EG}=45$ $\quad\therefore \overline{EG}=3$

$\therefore \overline{EF}=\overline{EG}+\overline{GF}=3+10=13$

ACT 37 106~107쪽

01 (1) $\triangle$ABC에서 $2:(2+4)=\overline{EG}:12$

$6\overline{EG}=24$ $\quad\therefore \overline{EG}=4$

(2) $\triangle$ACD에서 $4:(4+2)=\overline{GF}:6$

$6\overline{GF}=24$ $\quad\therefore \overline{GF}=4$

(3) $\overline{EF}=\overline{EG}+\overline{GF}=4+4=8$

02 (1) $\triangle$ABC에서 $3:(3+6)=\overline{EG}:12$

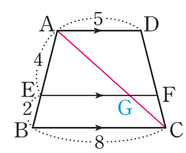
$9\overline{EG}=36$ $\quad\therefore \overline{EG}=4$

(2) $\triangle$ACD에서 $6:(6+3)=\overline{GF}:4$

$9\overline{GF}=24$ $\quad\therefore \overline{GF}=\dfrac{8}{3}$

(3) $\overline{EF}=\overline{EG}+\overline{GF}=4+\dfrac{8}{3}=\dfrac{20}{3}$

03



$\triangle$ABC에서 $4:(4+2)=\overline{EG}:8$

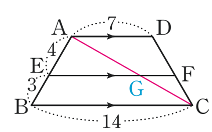
$6\overline{EG}=32$ $\quad\therefore \overline{EG}=\dfrac{16}{3}$

$\triangle$ACD에서 $2:(2+4)=\overline{GF}:5$

$6\overline{GF}=10$ $\quad\therefore \overline{GF}=\dfrac{5}{3}$

$\therefore \overline{EF}=\overline{EG}+\overline{GF}=\dfrac{16}{3}+\dfrac{5}{3}=7$

04



$\triangle$ABC에서 $4:(4+3)=\overline{EG}:14$

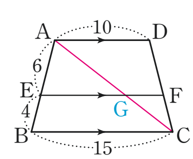
$7\overline{EG}=56$ $\quad\therefore \overline{EG}=8$

$\triangle$ACD에서 $3:(3+4)=\overline{GF}:7$

$7\overline{GF}=21$ $\quad\therefore \overline{GF}=3$

$\therefore \overline{EF}=\overline{EG}+\overline{GF}=8+3=11$

05



$\triangle$ABC에서 $6:(6+4)=\overline{EG}:15$

$10\overline{EG}=90$ $\quad\therefore \overline{EG}=9$

$\triangle$ACD에서 $4:(4+6)=\overline{GF}:10$

$10\overline{GF}=40$ $\quad\therefore \overline{GF}=4$

$\therefore \overline{EF}=\overline{EG}+\overline{GF}=9+4=13$

06 (3) $x:6=2:5$에서 $5x=12$ $\therefore x=\frac{12}{5}$

(4) $y:8=2:5$에서 $5y=16$ $\therefore y=\frac{16}{5}$

07 (3) $x:5=2:3$에서 $3x=10$ $\therefore x=\frac{10}{3}$

(4) $y:9=2:3$에서 $3y=18$ $\therefore y=6$

08 $\overline{AB}/\!/\overline{EF}/\!/\overline{DC}$이므로

$\overline{BE}:\overline{ED}=2:3$ $\therefore \overline{BE}:\overline{BD}=2:5$

$\triangle BCD$에서 $\overline{EF}:12=2:5$ $\therefore \overline{EF}=\frac{24}{5}$

09 $\overline{AB}/\!/\overline{EF}/\!/\overline{DC}$이므로

$\overline{BE}:\overline{ED}=5:4$ $\therefore \overline{BE}:\overline{BD}=5:9$

$\triangle BCD$에서 $\overline{EF}:12=5:9$ $\therefore \overline{EF}=\frac{20}{3}$

10 $\overline{AB}/\!/\overline{EF}/\!/\overline{DC}$이므로

$\overline{BE}:\overline{ED}=2:3$ $\therefore \overline{BE}:\overline{BD}=2:5$

$\triangle BCD$에서 $\overline{EF}:15=2:5$ $\therefore \overline{EF}=6$

ACT 38 108~109쪽

01 $\overline{BC}=2\overline{MN}=2\times5=10$

02 $\overline{MN}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times12=6$

03 $\overline{MN}/\!/\overline{BC}$이므로 $\angle x=60^\circ$ $\therefore x=60$

05 $\overline{AN}=\overline{NC}$이므로 $x=2\overline{AN}=2\times4=8$

06 $\overline{MN}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times16=8$

07 $\triangle ABC$에서 $\overline{BC}=2\overline{MN}=2\times7=14$

$\therefore x=\overline{BC}-\overline{BQ}=14-3=11$

08 $\triangle AQC$에서 $\overline{QC}=2\overline{PN}=2\times2=4$

$\therefore \overline{BQ}=\overline{BC}-\overline{QC}=10-4=6$

$\triangle ABQ$에서 $x=\frac{1}{2}\overline{BQ}=\frac{1}{2}\times6=3$

다른 풀이

$\triangle ABC$에서 $\overline{MN}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times10=5$

$\therefore x=\overline{MN}-\overline{PN}=5-2=3$

10 $\triangle DBC$에서 $\overline{BC}=2\overline{PQ}=2\times5=10$

$\triangle ABC$에서 $\overline{MN}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times10=5$

$\therefore x=\overline{MN}-\overline{MR}=5-4=1$

11 $\square DBFE$는 평행사변형이므로 $\overline{BF}=\overline{DE}=9$

$\overline{BC}=2\overline{DE}=2\times9=18$이므로

$x=\overline{BC}-\overline{BF}=18-9=9$

12 $\square DBFE$는 평행사변형이므로 $\overline{BF}=\overline{DE}=6$

$\overline{BC}=2\overline{DE}=2\times6=12$이므로

$x=\overline{BC}-\overline{BF}=12-6=6$

13 $\triangle ABC$에서 $\overline{PM}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times12=6$

$\triangle ABD$에서 $\overline{PN}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times8=4$

$\therefore x=\overline{PM}-\overline{PN}=6-4=2$

14 $\triangle ABC$에서 $\overline{PM}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times14=7$

$\triangle ABD$에서 $\overline{PN}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times20=10$

$\therefore x=\overline{PN}-\overline{PM}=10-7=3$

ACT 39 110~111쪽

01 (1) $\triangle ABC$에서 $\overline{MP}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times12=6$

(2) $\triangle ACD$에서 $\overline{PN}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times8=4$

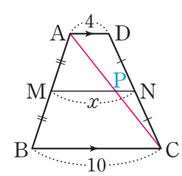
(3) $\overline{MN}=\overline{MP}+\overline{PN}=6+4=10$

02 (1) $\triangle ABC$에서 $\overline{MP}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times10=5$

(2) $\triangle ACD$에서 $\overline{PN}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times6=3$

(3) $\overline{MN}=\overline{MP}+\overline{PN}=5+3=8$

03

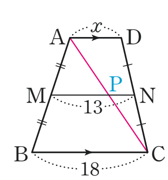


$\triangle ABC$에서 $\overline{MP}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times10=5$

$\triangle ACD$에서 $\overline{PN}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times4=2$

$\therefore x=\overline{MP}+\overline{PN}=5+2=7$

04

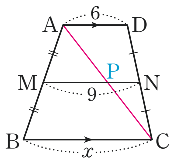


$\triangle ABC$에서 $\overline{MP}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times18=9$

$\therefore \overline{PN}=\overline{MN}-\overline{MP}=13-9=4$

$\triangle ACD$에서 $x=2\overline{PN}=2\times4=8$

05



$\triangle$ACD에서 $\overline{PN}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times6=3$

$\therefore\ \overline{MP}=\overline{MN}-\overline{PN}=9-3=6$

$\triangle$ABC에서 $x=2\overline{MP}=2\times6=12$

06 (1) $\triangle$ABD에서 $\overline{MP}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times9=\frac{9}{2}$

(2) $\triangle$ABC에서 $\overline{MQ}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times15=\frac{15}{2}$

(3) $\overline{PQ}=\overline{MQ}-\overline{MP}=\frac{15}{2}-\frac{9}{2}=3$

07 (1) $\triangle$ABD에서 $\overline{MP}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times6=3$

(2) $\triangle$ABC에서 $\overline{MQ}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times8=4$

(3) $\overline{PQ}=\overline{MQ}-\overline{MP}=4-3=1$

08 $\triangle$ABD에서 $\overline{MP}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times5=\frac{5}{2}$

$\triangle$ABC에서 $\overline{MQ}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times8=4$

$\therefore\ x=\overline{MQ}-\overline{MP}=4-\frac{5}{2}=\frac{3}{2}$

09 $\triangle$ABD에서 $\overline{MP}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times8=4$

$\therefore\ \overline{MQ}=\overline{MP}+\overline{PQ}=4+2=6$

$\triangle$ABC에서 $x=2\overline{MQ}=2\times6=12$

10 $\triangle$ABD에서 $\overline{MP}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times6=3$

$\overline{MP}=\overline{PQ}=3$이므로 $\overline{MQ}=2\times3=6$

$\triangle$ABC에서 $x=2\overline{MQ}=2\times6=12$

ACT+ 40 112~113쪽

02 ($\triangle$DEF의 둘레의 길이)$=\overline{DE}+\overline{EF}+\overline{DF}$

$=\frac{1}{2}\overline{AC}+\frac{1}{2}\overline{AB}+\frac{1}{2}\overline{BC}$

$=6+6+5=17$

03 ($\triangle$DEF의 둘레의 길이)$=\overline{DE}+\overline{EF}+\overline{DF}$

$=\frac{1}{2}\overline{AC}+\frac{1}{2}\overline{AB}+\frac{1}{2}\overline{BC}$

$=\frac{5}{2}+\frac{9}{2}+4=11$

04 ($\triangle$DEF의 둘레의 길이)$=\overline{DE}+\overline{EF}+\overline{DF}$

$=\frac{1}{2}\overline{AC}+\frac{1}{2}\overline{AB}+\frac{1}{2}\overline{BC}$

$=3+6+4=13$

05 ($\triangle$DEF의 둘레의 길이)$=\overline{DE}+\overline{EF}+\overline{DF}$

$=\frac{1}{2}\overline{AC}+\frac{1}{2}\overline{AB}+\frac{1}{2}\overline{BC}$

$=5+3+4=12$

07 $\triangle$ABC, $\triangle$ACD에서 $\overline{EF}=\overline{HG}=\frac{1}{2}\overline{AC}=\frac{1}{2}\times12=6$

$\triangle$ABD, $\triangle$BCD에서 $\overline{EH}=\overline{FG}=\frac{1}{2}\overline{BD}=\frac{1}{2}\times12=6$

따라서 □EFGH의 둘레의 길이는

$4\times6=24$

08 $\triangle$ABC, $\triangle$ACD에서 $\overline{EF}=\overline{HG}=\frac{1}{2}\overline{AC}=\frac{1}{2}\times8=4$

$\triangle$ABD, $\triangle$BCD에서 $\overline{EH}=\overline{FG}=\frac{1}{2}\overline{BD}=\frac{1}{2}\times10=5$

따라서 □EFGH의 둘레의 길이는

$2\times(4+5)=18$

09 $\triangle$ABC, $\triangle$ACD에서 $\overline{EF}=\overline{HG}=\frac{1}{2}\overline{AC}=\frac{1}{2}\times8=4$

$\triangle$ABD, $\triangle$BCD에서 $\overline{EH}=\overline{FG}=\frac{1}{2}\overline{BD}=\frac{1}{2}\times8=4$

따라서 □EFGH의 둘레의 길이는

$4\times4=16$

10 $\triangle$ABC, $\triangle$ACD에서 $\overline{EF}=\overline{HG}=\frac{1}{2}\overline{AC}=\frac{1}{2}\times9=\frac{9}{2}$

$\triangle$ABD, $\triangle$BCD에서 $\overline{EH}=\overline{FG}=\frac{1}{2}\overline{BD}=\frac{1}{2}\times12=6$

따라서 □EFGH의 둘레의 길이는

$2\times\left(\frac{9}{2}+6\right)=21$

ACT+ 41 114~115쪽

02 $\triangle$BGE에서 $\overline{EG}=2\overline{DC}=2\times5=10$

$\therefore\ x=\overline{EG}-\overline{EF}=10-3=7$

03 $\triangle$AEC에서 $\overline{DF}\,/\!/\,\overline{EC}$

$\overline{EC}=2\overline{DF}=2\times5=10$

$\triangle$BGD에서 $\overline{DG}=2\overline{EC}=2\times10=20$

$\therefore\ x=\overline{DG}-\overline{DF}=20-5=15$

04 $\triangle$ADG에서 $\overline{DG}=2\overline{EF}=2\times2=4$

$\triangle$BCF에서 $\overline{BF}=2\overline{DG}=2\times4=8$

$\therefore\ x=\overline{BF}-\overline{EF}=8-2=6$

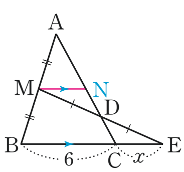
05 △ADG에서 $\overline{EF}=\frac{1}{2}\overline{DG}=\frac{1}{2}\times12=6$
△BCF에서 $\overline{BF}=2\overline{DG}=2\times12=24$
$\therefore x=\overline{BF}-\overline{EF}=24-6=18$

06 △ABF에서 $\overline{DE}/\!/\overline{BF}$이므로
△CED에서 $\overline{DE}=2\overline{GF}=2\times3=6$
△ABF에서 $\overline{BF}=2\overline{DE}=2\times6=12$
$\therefore x=\overline{BF}-\overline{GF}=12-3=9$

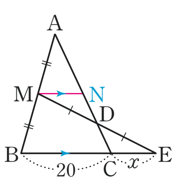
08 △ABC에서 $\overline{BC}=2\overline{MN}=2\times3=6$
△MND≡△ECD (ASA 합동)이므로 $\overline{CE}=\overline{MN}=3$
$\therefore x=\overline{BC}+\overline{CE}=6+3=9$

09 △MND≡△ECD (ASA 합동)이므로 $\overline{MN}=\overline{CE}=5$
△ABC에서 $x=2\overline{MN}=2\times5=10$

10 △MND≡△ECD (ASA 합동)이므로 $\overline{ND}=\overline{CD}=2$
△ABC에서 $\overline{AN}=\overline{NC}=\overline{ND}+\overline{CD}=2+2=4$
$\therefore x=\overline{AN}+\overline{ND}=4+2=6$

11


$\overline{MN}/\!/\overline{BE}$가 되도록 $\overline{MN}$을 그으면
△ABC에서 $\overline{MN}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times6=3$
△MND≡△ECD (ASA 합동)이므로 $x=\overline{MN}=3$

12


$\overline{MN}/\!/\overline{BE}$가 되도록 $\overline{MN}$을 그으면
△ABC에서 $\overline{MN}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times20=10$
△MND≡△ECD (ASA 합동)이므로 $x=\overline{MN}=10$

ACT 42 118~119쪽

01 $\triangle ABD=\frac{1}{2}\triangle ABC=\frac{1}{2}\times24=12\ (\text{cm}^2)$

02 $\triangle ABE=\frac{1}{2}\triangle ABD=\frac{1}{2}\times12=6\ (\text{cm}^2)$

03 $\triangle BEF=\frac{1}{3}\triangle ABD=\frac{1}{3}\times12=4\ (\text{cm}^2)$

04 $\triangle ADC=\triangle ABD=9\ \text{cm}^2$

05 $\triangle ABC=2\triangle ABD=2\times9=18\ (\text{cm}^2)$

06 $\triangle CEF=\frac{1}{3}\triangle ADC=\frac{1}{3}\times9=3\ (\text{cm}^2)$

07 $x=2\overline{DG}=2\times3=6$

08 $x=\frac{1}{2}\overline{BG}=\frac{1}{2}\times9=\frac{9}{2}$

09 $x=\frac{3}{2}\overline{CG}=\frac{3}{2}\times8=12$

10 $x=\frac{1}{2}\overline{AG}=\frac{1}{2}\times8=4$
$y=3\overline{DG}=3\times5=15$

11 $x=\frac{1}{2}\overline{BC}=\frac{1}{2}\times14=7$
$y=\frac{1}{2}\overline{AG}=\frac{1}{2}\times10=5$

12 직각삼각형에서 빗변의 중점은 외심이므로
$\overline{AD}=\overline{BD}=\overline{CD}=\frac{1}{2}\times12=6$ $\quad\therefore x=6$
$y=\frac{2}{3}\overline{CD}=\frac{2}{3}\times6=4$

ACT 43 120~121쪽

01 $\triangle BCG=\frac{1}{3}\triangle ABC=\frac{1}{3}\times24=8\ (\text{cm}^2)$

02 $\triangle BDG=\frac{1}{6}\triangle ABC=\frac{1}{6}\times24=4\ (\text{cm}^2)$

03 $\triangle BGF=\frac{1}{6}\triangle ABC=\frac{1}{6}\times24=4\ (\text{cm}^2)$

04 $\square BDGF=\triangle GBD+\triangle GBF$
$=\frac{1}{6}\triangle ABC+\frac{1}{6}\triangle ABC$
$=\frac{1}{3}\triangle ABC=\frac{1}{3}\times24=8\ (\text{cm}^2)$

05 $\triangle AFG+\triangle GCD=\frac{1}{6}\triangle ABC+\frac{1}{6}\triangle ABC$
$=\frac{1}{3}\triangle ABC=\frac{1}{3}\times24=8\ (\text{cm}^2)$

06 $\triangle AGE+\triangle BGF+\triangle CDG$
$=\frac{1}{6}\triangle ABC+\frac{1}{6}\triangle ABC+\frac{1}{6}\triangle ABC$
$=\frac{1}{2}\triangle ABC=\frac{1}{2}\times24=12\ (\text{cm}^2)$

07 $\triangle ABG=2\triangle AEG=2\times3=6\ (cm^2)$

08 $\triangle BDG=\triangle AEG=3\ cm^2$

09 $\square GDCE=2\triangle AEG=2\times3=6\ (cm^2)$

10 $\triangle ABC=6\triangle AEG=6\times3=18\ (cm^2)$

11 $\triangle AGD=\frac{1}{2}\triangle AGC=\frac{1}{2}\times\left(\frac{1}{3}\triangle ABC\right)$
$=\frac{1}{6}\triangle ABC=\frac{1}{6}\times18=3\ (cm^2)$

12 $\triangle ABG+\square GDCE$
$=\frac{1}{3}\triangle ABC+\frac{1}{3}\triangle ABC$
$=\frac{2}{3}\triangle ABC=\frac{2}{3}\times18=12\ (cm^2)$

13 $\square ADGE=\triangle ADG+\triangle AEG$
$=\frac{1}{2}\triangle ABG+\frac{1}{2}\triangle ACG$
$=\frac{1}{2}\times\left(\frac{1}{3}\triangle ABC\right)+\frac{1}{2}\times\left(\frac{1}{3}\triangle ABC\right)$
$=\frac{1}{6}\triangle ABC+\frac{1}{6}\triangle ABC$
$=\frac{1}{3}\triangle ABC=\frac{1}{3}\times18=6\ (cm^2)$

14 $\triangle EDG=\frac{1}{2}\triangle GBD=\frac{1}{2}\times\left(\frac{1}{6}\triangle ABC\right)$
$=\frac{1}{12}\triangle ABC=\frac{1}{12}\times18=\frac{3}{2}\ (cm^2)$

ACT+ 44 122~123쪽

02 $\triangle GBC$에서 $\overline{GD}=3\overline{G'D}=3\times3=9$
$\triangle ABC$에서 $x=3\overline{GD}=3\times9=27$

03 $\triangle ABC$에서 $\overline{GD}=\frac{1}{3}\overline{AD}=\frac{1}{3}\times24=8$
$\triangle GBC$에서 $x=\frac{2}{3}\overline{GD}=\frac{2}{3}\times8=\frac{16}{3}$

04 $\triangle GBC$에서 $\overline{GD}=\frac{3}{2}\overline{GG'}=\frac{3}{2}\times6=9$
$\triangle ABC$에서 $x=2\overline{GD}=2\times9=18$

05 $\triangle GBC$에서 $\overline{GD}=\frac{3}{2}\overline{GG'}=\frac{3}{2}\times4=6$
$\triangle ABC$에서 $x=3\overline{GD}=3\times6=18$

06 $\triangle G'BC=\frac{1}{3}\triangle GBC=\frac{1}{3}\times\left(\frac{1}{3}\triangle ABC\right)$
$=\frac{1}{9}\triangle ABC=\frac{1}{9}\times18=2\ (cm^2)$

08 점 G가 $\triangle ABC$의 무게중심이므로 $\overline{AE}=\overline{EB}$
$\triangle ABD$에서 $\overline{AD}/\!/\overline{EF}$이므로 $\overline{AD}=2\overline{EF}=2\times9=18$
$\therefore x=\frac{1}{3}\overline{AD}=\frac{1}{3}\times18=6$

09 점 G가 $\triangle ABC$의 무게중심이므로
$\overline{BD}=\overline{DC}$이고 $\overline{BE}=\frac{3}{2}\overline{BG}=\frac{3}{2}\times4=6$
$\triangle BCE$에서 $\overline{BE}/\!/\overline{DF}$이므로 $\overline{DF}=\frac{1}{2}\overline{BE}=\frac{1}{2}\times6=3$

11 점 G가 $\triangle ABC$의 무게중심이므로
$\triangle ABD$에서 $\overline{AE}:\overline{EB}=2:1$
$8:x=2:1$
$2x=8 \qquad \therefore x=4$

12 점 G가 $\triangle ABC$의 무게중심이므로
$\overline{BD}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times12=6$
$\triangle ABD$에서 $\overline{EG}:\overline{BD}=2:3$
$x:6=2:3$
$3x=12 \qquad \therefore x=4$

ACT+ 45 124~125쪽

02 점 O는 두 대각선의 교점이므로
$\overline{BO}=\frac{1}{2}\overline{BD}=\frac{1}{2}\times18=9$
점 P는 $\triangle ABC$의 무게중심이므로
$x=\frac{2}{3}\overline{BO}=\frac{2}{3}\times9=6$
다른 풀이
$x=\frac{1}{3}\overline{BD}=\frac{1}{3}\times18=6$

03 점 P는 $\triangle ABC$의 무게중심이므로
$\overline{BO}=\frac{3}{2}\overline{BP}=\frac{3}{2}\times4=6$
점 O는 두 대각선의 교점이므로
$x=2\overline{BO}=2\times6=12$
다른 풀이
$x=3\overline{BP}=3\times4=12$

04 점 P는 $\triangle ABC$의 무게중심이므로
$\overline{BO}=3\overline{PO}=3\times5=15$
점 O는 두 대각선의 교점이므로
$x=2\overline{BO}=2\times15=30$

05 두 점 P, Q는 각각 $\triangle ABC$, $\triangle ACD$의 무게중심이므로

$x=\overline{BP}+\overline{PO}+\overline{OQ}+\overline{QD}$

$=2\overline{PO}+\overline{PO}+\overline{OQ}+2\overline{OQ}$

$=3(\overline{PO}+\overline{OQ})$

$=3\overline{PQ}=3\times 6=18$

다른 풀이

$x=3\overline{PQ}=3\times 6=18$

07 $\triangle ABP=\frac{1}{3}\triangle ABC$

$=\frac{1}{3}\times\left(\frac{1}{2}\square ABCD\right)$

$=\frac{1}{6}\square ABCD=\frac{1}{6}\times 48=8\ (\text{cm}^2)$

08 $\triangle DQM=\frac{1}{6}\triangle ACD$

$=\frac{1}{6}\times\left(\frac{1}{2}\square ABCD\right)$

$=\frac{1}{12}\square ABCD=\frac{1}{12}\times 48=4\ (\text{cm}^2)$

09 $\triangle AQD=\frac{1}{3}\triangle ACD$

$=\frac{1}{3}\times\left(\frac{1}{2}\square ABCD\right)$

$=\frac{1}{6}\square ABCD=\frac{1}{6}\times 48=8\ (\text{cm}^2)$

10 $\triangle APQ=\frac{1}{3}\triangle ABD$

$=\frac{1}{3}\times\left(\frac{1}{2}\square ABCD\right)$

$=\frac{1}{6}\square ABCD=\frac{1}{6}\times 48=8\ (\text{cm}^2)$

TEST 04 126~127쪽

01 $6:3=x:4$에서 $3x=24$ $\therefore x=8$

$6:(6+3)=8:y$에서 $6y=72$ $\therefore y=12$

$\therefore x+y=8+12=20$

02 $9:6=15:x$에서 $9x=90$ $\therefore x=10$

$9:6=12:(y-12)$에서 $9y-108=72$

$9y=180$ $\therefore y=20$

$\therefore x+y=10+20=30$

03 ① $6:3=4:2$이므로 $\overline{BC}/\!/\overline{DE}$

② $12:8=9:6$이므로 $\overline{BC}/\!/\overline{DE}$

③ $9:3=6:2$이므로 $\overline{BC}/\!/\overline{DE}$

④ $6:2\neq 7:3$이므로 $\overline{BC}$와 $\overline{DE}$는 평행하지 않다.

⑤ $6:15=4:10$이므로 $\overline{BC}/\!/\overline{DE}$

따라서 $\overline{BC}/\!/\overline{DE}$가 아닌 것은 ④이다.

04 $\overline{CD}=x$ cm라고 하면

$6:8=(7-x):x$에서 $6x=56-8x$

$14x=56$ $\therefore x=4$, 즉 $\overline{CD}=4$ cm

05 $\overline{BC}=x$ cm라고 하면

$6:4=(x+8):8$에서 $4x+32=48$

$4x=16$ $\therefore x=4$, 즉 $\overline{BC}=4$ cm

06 $\overline{BE}:\overline{ED}=3:2$이므로 $\overline{BE}:\overline{BD}=3:5$

$\triangle BCD$에서 $\overline{EF}:10=3:5$

$5\overline{EF}=30$ $\therefore \overline{EF}=6$

07 $\triangle ABD$에서

$\overline{MP}=\frac{1}{2}\overline{AD}=\frac{1}{2}\times 8=4\ (\text{cm})$

$\triangle ABC$에서

$\overline{MQ}=\frac{1}{2}\overline{BC}=\frac{1}{2}\times 14=7\ (\text{cm})$

$\therefore \overline{PQ}=\overline{MQ}-\overline{MP}=7-4=3\ (\text{cm})$

08 ($\triangle DEF$의 둘레의 길이)

$=\frac{1}{2}$($\triangle ABC$의 둘레의 길이)

$=\frac{1}{2}\times 24=12\ (\text{cm})$

09 $\triangle ABC$, $\triangle ACD$에서

$\overline{FG}=\overline{EH}=\frac{1}{2}\overline{AC}=\frac{1}{2}\times 8=4\ (\text{cm})$

$\triangle ABD$, $\triangle BCD$에서

$\overline{FE}=\overline{GH}=\frac{1}{2}\overline{BD}=\frac{1}{2}\times 8=4\ (\text{cm})$

따라서 $\square EFGH$의 둘레의 길이는

$4\times 4=16\ (\text{cm})$

10 $\triangle AGD$에서

$\overline{FE}=\frac{1}{2}\overline{GD}=\frac{1}{2}\times 8=4\ (\text{cm})$

$\triangle BCF$에서

$\overline{FC}=2\overline{GD}=2\times 8=16\ (\text{cm})$

$\therefore \overline{CE}=\overline{FC}-\overline{FE}=16-4=12\ (\text{cm})$

11 $\triangle ABE=\frac{1}{2}\triangle ABD$

$=\frac{1}{2}\times\left(\frac{1}{2}\triangle ABC\right)$

$=\frac{1}{4}\triangle ABC$

$=\frac{1}{4}\times 32=8\ (\text{cm}^2)$

12 $x=\overline{DC}=6$, $y=\frac{2}{3}\overline{BE}=\frac{2}{3}\times 9=6$

$\therefore x+y=6+6=12$

13 $\triangle ABC=6\triangle GBD=6\times 6=36\ (\text{cm}^2)$

14 $\triangle ABC$에서 $\overline{GD}=\frac{1}{3}\overline{AD}=\frac{1}{3}\times 12=4\ (\text{cm})$

$\triangle GBC$에서 $\overline{GG'}=\frac{2}{3}\overline{GD}=\frac{2}{3}\times 4=\frac{8}{3}\ (\text{cm})$

15 $\overline{BD}=3\overline{PQ}=3\times 8=24\ (\text{cm})$

Chapter Ⅳ 피타고라스 정리

ACT 46 132~133쪽

04 $x^2=12^2+9^2=225$ $\quad\therefore x=15\ (\because x>0)$

05 $x^2+6^2=10^2$이므로
$x^2=64$ $\quad\therefore x=8\ (\because x>0)$

06 $15^2+x^2=17^2$이므로
$x^2=64$ $\quad\therefore x=8\ (\because x>0)$

07 $5^2+x^2=13^2$이므로
$x^2=144$ $\quad\therefore x=12\ (\because x>0)$

08 $12^2+x^2=15^2$이므로
$x^2=81$ $\quad\therefore x=9\ (\because x>0)$

10 $\triangle$ABD에서 $15^2+x^2=17^2$이므로
$x^2=64$ $\quad\therefore x=8\ (\because x>0)$
$\triangle$ADC에서 $y^2=8^2+6^2=100$
$\therefore y=10\ (\because y>0)$

11 $\triangle$ABD에서 $9^2+x^2=15^2$이므로
$x^2=144$ $\quad\therefore x=12\ (\because x>0)$
$\triangle$ADC에서 $y^2=12^2+5^2=169$
$\therefore y=13\ (\because y>0)$

13 $\triangle$ABC에서 $(7+9)^2+x^2=20^2$이므로
$x^2=144$ $\quad\therefore x=12\ (\because x>0)$
$\triangle$ADC에서 $y^2=9^2+12^2=225$
$\therefore y=15\ (\because y>0)$

14 $\triangle$ADC에서 $6^2+x^2=10^2$이므로
$x^2=64$ $\quad\therefore x=8\ (\because x>0)$
$\triangle$ABC에서 $y^2=(9+6)^2+8^2=289$
$\therefore y=17\ (\because y>0)$

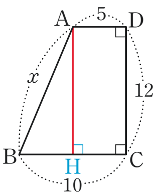
ACT+ 47 134~135쪽

01 $\overline{AC}^2=6^2+8^2=100$ $\quad\therefore \overline{AC}=10\ (\because \overline{AC}>0)$

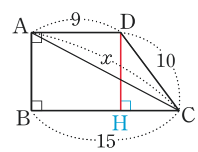
02 $15^2+\overline{CD}^2=17^2$이므로
$\overline{CD}^2=64$ $\quad\therefore \overline{CD}=8\ (\because \overline{CD}>0)$
$\therefore \square$ABCD$=15\times8=120$

03 $\square$BEFD$=\overline{BD}^2=7^2+4^2=65$

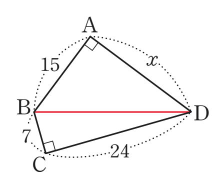
05 $\triangle$ABC에서 $\overline{AC}^2=3^2+4^2=25$
$\therefore \overline{AC}=5\ (\because \overline{AC}>0)$
$\triangle$ACD에서 $x^2=5^2+12^2=169$
$\therefore x=13\ (\because x>0)$

07


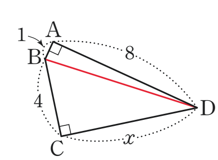
$\overline{AH}$를 그으면 $\overline{HC}=\overline{AD}=5$이므로
$\overline{BH}=\overline{BC}-\overline{HC}=10-5=5$
$\triangle$ABH에서 $\overline{AH}=\overline{DC}=12$이므로
$x^2=5^2+12^2=169$ $\quad\therefore x=13\ (\because x>0)$

08


$\overline{DH}$를 그으면 $\overline{BH}=\overline{AD}=9$이므로
$\overline{HC}=\overline{BC}-\overline{BH}=15-9=6$
$\triangle$DHC에서 $6^2+\overline{DH}^2=10^2$이므로
$\overline{DH}^2=64$ $\quad\therefore \overline{DH}=8\ (\because \overline{DH}>0)$
$\triangle$ABC에서 $\overline{AB}=\overline{DH}=8$이므로
$x^2=15^2+8^2=289$ $\quad\therefore x=17\ (\because x>0)$

10


$\overline{BD}$를 그으면
$\triangle$BCD에서 $\overline{BD}^2=7^2+24^2=625$
$\triangle$ABD에서 $15^2+x^2=625$이므로
$x^2=400$ $\quad\therefore x=20\ (\because x>0)$

12


$\overline{BD}$를 그으면
$\triangle$ABD에서 $\overline{BD}^2=1^2+8^2=65$
$\triangle$BCD에서 $x^2+4^2=65$이므로
$x^2=49$ $\quad\therefore x=7\ (\because x>0)$

ACT 48 136~137쪽

03 $\square AIHC=\square BFGC-\square ADEB$
$=84-51=33\ (cm^2)$

04 $\square AIHB=\square CBGF-\square ADEC$
$=98-42=56\ (cm^2)$

06 $\square AIHC=\square BFGC-\square ADEB$
$=41-16=25\ (cm^2)$
따라서 □AIHC의 한 변의 길이는 5 cm이다.

07 $\square BFGC=\square ACHI+\square ADEB$
$=28+72=100\ (cm^2)$
따라서 □BFGC의 한 변의 길이는 10 cm이다.

09 △ABC에서 $\overline{AC}^2+8^2=10^2$이므로
$\overline{AC}^2=36$ $\quad\therefore \overline{AC}=6\ (\because \overline{AC}>0)$
$\therefore \square ACHI=6^2=36\ (cm^2)$
다른 풀이
$\square ABED=8^2=64\ (cm^2)$, $\square BFGC=10^2=100\ (cm^2)$
$\square ACHI+\square ABED=\square BFGC$이므로
$\square ACHI+64=100$
$\therefore \square ACHI=100-64=36\ (cm^2)$

10 $\triangle LFM=\frac{1}{2}\square BFML=\frac{1}{2}\square ADEB$
$=\frac{1}{2}\times 20^2=200\ (cm^2)$

ACT 49 138~139쪽

01 (1) $\overline{AE}=\overline{DH}=3$
△AEH에서 $\overline{EH}^2=3^2+4^2=25$
$\therefore \overline{EH}=5\ (\because \overline{EH}>0)$
$\overline{EH}=\overline{EF}=\overline{FG}=\overline{GH}=5$이므로
(□EFGH의 둘레의 길이)$=4\times5=20$
(2) $\triangle AEH\equiv\triangle BFE\equiv\triangle CGF\equiv\triangle DHG$ (SAS 합동)이고
$\angle AEH+\angle AHE=\angle AEH+\angle BEF=90°$이므로
$\angle HEF=180°-(\angle AEH+\angle BEF)=90°$
따라서 □EFGH는 한 변의 길이가 5인 정사각형이므로 그 넓이는 $5^2=25$이다.

02 (1) $\overline{AE}=\overline{DH}=8$
△AEH에서 $\overline{EH}^2=8^2+15^2=289$
$\therefore \overline{EH}=17\ (\because \overline{EH}>0)$
$\overline{EH}=\overline{EF}=\overline{FG}=\overline{GH}=17$이므로
(□EFGH의 둘레의 길이)$=4\times17=68$
(2) □EFGH는 한 변의 길이가 17인 정사각형이므로 그 넓이는 $17^2=289$이다.

03 □EFGH는 정사각형이므로 $\overline{EH}^2=20$
△AEH에서 $\overline{AE}^2+2^2=20$이므로
$\overline{AE}^2=16$ $\quad\therefore \overline{AE}=4\ (\because \overline{AE}>0)$
$\overline{AD}=\overline{AH}+\overline{HD}=\overline{AH}+\overline{AE}=2+4=6$
$\therefore \square ABCD=\overline{AD}^2=6^2=36$

04 □EFGH는 정사각형이므로 $\overline{EH}^2=74$
△AEH에서 $\overline{AH}^2+5^2=74$이므로
$\overline{AH}^2=49$ $\quad\therefore \overline{AH}=7\ (\because \overline{AH}>0)$
$\overline{AB}=\overline{AE}+\overline{EB}=\overline{AE}+\overline{AH}=5+7=12$
$\therefore \square ABCD=\overline{AB}^2=12^2=144$

05 □EFGH는 정사각형이므로 $\overline{HG}^2=100$
△HGD에서 $\overline{DG}^2+6^2=100$이므로
$\overline{DG}^2=64$ $\quad\therefore \overline{DG}=8\ (\because \overline{DG}>0)$
$\overline{AD}=\overline{AH}+\overline{HD}=\overline{DG}+\overline{HD}=8+6=14$
$\therefore \square ABCD=\overline{AD}^2=14^2=196$

06 (1) △BCP에서 $\overline{PB}^2+12^2=15^2$이므로
$\overline{PB}^2=81$ $\quad\therefore \overline{PB}=9\ (\because \overline{PB}>0)$
$\overline{QC}=\overline{PB}=9$이므로
$\overline{PQ}=\overline{PC}-\overline{QC}=12-9=3$
(2) $\square PQRS=\overline{PQ}^2=3^2=9$

07 (1) △ABQ에서 $\overline{AQ}^2+8^2=17^2$이므로
$\overline{AQ}^2=225$ $\quad\therefore \overline{AQ}=15\ (\because \overline{AQ}>0)$
$\overline{BR}=\overline{AQ}=15$이므로
$\overline{QR}=\overline{BR}-\overline{BQ}=15-8=7$
(2) $\square PQRS=\overline{QR}^2=7^2=49$

08 (1) $\overline{CA}=\overline{DE}=5$이므로
△ABC에서 $\overline{AB}^2=5^2+12^2=169$
$\therefore \overline{AB}=13\ (\because \overline{AB}>0)$
(2) $\overline{AE}=\overline{AB}=13$이고
$\angle CAB+\angle DAE=\angle CAB+\angle CBA=90°$이므로
$\angle BAE=180°-(\angle CAB+\angle DAE)$
$=180°-90°=90°$
$\therefore \triangle ABE=\frac{1}{2}\times13\times13=\frac{169}{2}$

09 (1) $\overline{CA}=\overline{DE}=15$이므로
△ABC에서 $\overline{AB}^2=15^2+8^2=289$
$\therefore \overline{AB}=17\ (\because \overline{AB}>0)$
(2) $\overline{AE}=\overline{AB}=17$이고 $\angle BAE=90°$이므로
$\triangle ABE=\frac{1}{2}\times17\times17=\frac{289}{2}$

ACT 50 140~141쪽

01 $4^2+5^2 \neq 7^2$이므로 직각삼각형이 아니다.

02 $6^2+8^2=10^2$이므로 직각삼각형이다.

03 $15^2+8^2 \neq 16^2$이므로 직각삼각형이 아니다.

04 $12^2+5^2=13^2$이므로 직각삼각형이다.

05 $3^2+4^2=5^2$이므로 직각삼각형이다.

06 $2^2+5^2 \neq 6^2$이므로 직각삼각형이 아니다.

07 $4^2+7^2 \neq 9^2$이므로 직각삼각형이 아니다.

08 $8^2+15^2=17^2$이므로 직각삼각형이다.

09 $9^2+10^2 \neq 13^2$이므로 직각삼각형이 아니다.

11 $14^2<10^2+12^2$이므로 예각삼각형이다.

12 $10^2<8^2+9^2$이므로 예각삼각형이다.

13 $11^2>7^2+5^2$이므로 둔각삼각형이다.

14 $20^2=12^2+16^2$이므로 직각삼각형이다.

16 x가 가장 긴 변의 길이이므로
$4<x<3+4$, 즉 $4<x<7$ ...... ㉠
둔각삼각형이 되려면
$x^2>3^2+4^2$ $\therefore x^2>25$ ...... ㉡
㉠, ㉡에 의해 자연수 x의 값은 6이다.

17 x가 가장 긴 변의 길이이므로
$12<x<9+12$, 즉 $12<x<21$ ...... ㉠
예각삼각형이 되려면
$x^2<9^2+12^2$ $\therefore x^2<225$ ...... ㉡
㉠, ㉡에 의해 자연수 x의 값은 13, 14이다.

ACT 51 142~143쪽

01 $15^2=9x$ $\therefore x=25$
$y^2+15^2=25^2$이므로
$y^2=625-225=400$
$\therefore y=20$ ($\because y>0$)

02 $x^2=3^2+4^2=25$ $\therefore x=5$ ($\because x>0$)
$3\times4=5\times y$이므로 $y=\frac{12}{5}$

03 $y^2+8^2=17^2$이므로
$y^2=225$ $\therefore y=15$ ($\because y>0$)
$17\times x=15\times8$이므로 $x=\frac{120}{17}$

05 $\overline{DE}^2+\overline{BC}^2=\overline{BE}^2+\overline{CD}^2$이므로
$8^2+x^2=10^2+12^2$ $\therefore x^2=180$

06 $\overline{DE}^2+\overline{BC}^2=\overline{BE}^2+\overline{CD}^2$이므로
$x^2+13^2=9^2+11^2$ $\therefore x^2=33$

08 $\overline{AB}^2+\overline{CD}^2=\overline{AD}^2+\overline{BC}^2$이므로
$4^2+9^2=8^2+x^2$ $\therefore x^2=33$

09 $\overline{AB}^2+\overline{CD}^2=\overline{AD}^2+\overline{BC}^2$이므로
$6^2+6^2=3^2+x^2$ $\therefore x^2=63$

11 $\overline{AP}^2+\overline{CP}^2=\overline{BP}^2+\overline{DP}^2$이므로
$7^2+7^2=x^2+6^2$ $\therefore x^2=62$

12 $\overline{AP}^2+\overline{CP}^2=\overline{BP}^2+\overline{DP}^2$이므로
$8^2+x^2=3^2+10^2$ $\therefore x^2=45$

ACT 52 144~145쪽

02 (색칠한 부분의 넓이)$=11\pi+32\pi=43\pi$

03 (색칠한 부분의 넓이)$=21\pi-8\pi=13\pi$

05 지름의 길이가 6인 반원의 넓이는
$\frac{1}{2}\times\pi\times3^2=\frac{9}{2}\pi$
$\therefore$ (색칠한 부분의 넓이)$=18\pi+\frac{9}{2}\pi=\frac{45}{2}\pi$

06 지름의 길이가 16인 반원의 넓이는
$\frac{1}{2}\times\pi\times8^2=32\pi$
$\therefore$ (색칠한 부분의 넓이)$=49\pi-32\pi=17\pi$

08 (색칠한 부분의 넓이)$=8+10=18$ (cm^2)

09 (색칠한 부분의 넓이)$=15-9=6$ (cm^2)

10 (색칠한 부분의 넓이)$=32-13=19$ (cm^2)

12 $\overline{AC}^2+5^2=13^2$이므로
$\overline{AC}^2=144$ $\therefore \overline{AC}=12$ ($\because \overline{AC}>0$)
$\therefore$ (색칠한 부분의 넓이)
$=\triangle ABC$
$=\frac{1}{2}\times 12\times 5=30$ (cm^2)

13 $\overline{AB}^2+8^2=17^2$이므로
$\overline{AB}^2=225$ $\therefore \overline{AB}=15$ ($\because \overline{AB}>0$)
$\therefore$ (색칠한 부분의 넓이)
$=\triangle ABC$
$=\frac{1}{2}\times 15\times 8=60$ (cm^2)

TEST 05 146~147쪽

01 $x^2+9^2=15^2$이므로
$x^2=144$ $\therefore x=12$ ($\because x>0$)

02 $\triangle ADC$에서 $\overline{AD}^2+15^2=17^2$이므로
$\overline{AD}^2=64$ $\therefore \overline{AD}=8$ ($\because \overline{AD}>0$)
$\triangle ABD$에서 $x^2+8^2=10^2$이므로
$x^2=36$ $\therefore x=6$ ($\because x>0$)

03 $\triangle ADC$에서 $5^2+\overline{AC}^2=13^2$이므로
$\overline{AC}^2=144$ $\therefore \overline{AC}=12$ ($\because \overline{AC}>0$)
$\triangle ABC$에서 $x^2=(11+5)^2+12^2=400$
$\therefore x=20$ ($\because x>0$)

04 $\triangle ABC$에서 $\overline{AC}^2=9^2+12^2=225$
$\therefore \overline{AC}=15$ ($\because \overline{AC}>0$)
$\triangle ACD$에서 $x^2=15^2+8^2=289$
$\therefore x=17$ ($\because x>0$)

05 $\overline{AB}^2+6^2=10^2$이므로
$\overline{AB}^2=64$ $\therefore \overline{AB}=8$ ($\because \overline{AB}>0$)
$\therefore \triangle BFM=\frac{1}{2}\square BFML$
$=\frac{1}{2}\square ADEB$
$=\frac{1}{2}\times 8^2=32$ (cm^2)

06 $\square EFGH$는 정사각형이므로 $\overline{EH}^2=289$
$\triangle AEH$에서 $\overline{AE}^2+8^2=289$이므로
$\overline{AE}^2=225$ $\therefore \overline{AE}=15$ ($\because \overline{AE}>0$)
$\overline{AD}=\overline{AH}+\overline{HD}=\overline{AH}+\overline{AE}=8+15=23$
$\therefore \square ABCD=\overline{AD}^2=23^2=529$

07 ① $3^2+6^2\neq 7^2$이므로 직각삼각형이 아니다.
② $3^2+7^2\neq 9^2$이므로 직각삼각형이 아니다.
③ $6^2+8^2=10^2$이므로 직각삼각형이다.
④ $8^2+9^2\neq 12^2$이므로 직각삼각형이 아니다.
⑤ $8^2+14^2\neq 17^2$이므로 직각삼각형이 아니다.
따라서 직각삼각형인 것은 ③이다.

08 ㉠ $3^2<2^2+3^2$ ㉢ $10^2<5^2+9^2$
따라서 예각삼각형은 ㉠, ㉢이다.

09 ㉡ $11^2>4^2+8^2$ ㉤ $11^2>6^2+8^2$
㉥ $13^2>7^2+9^2$
따라서 둔각삼각형은 ㉡, ㉤, ㉥이다.

10 x가 가장 긴 변의 길이이므로
$15<x<8+15$, 즉 $15<x<23$ …… ㉠
둔각삼각형이 되려면
$x^2>8^2+15^2$ $\therefore x^2>289$ …… ㉡
㉠, ㉡에 의해 자연수 x는 18, 19, 20, 21, 22의 5개이다.

11 $\overline{BC}^2=5^2+12^2=169$
$\therefore \overline{BC}=13$ ($\because \overline{BC}>0$)
$5\times 12=13\times x$이므로 $x=\frac{60}{13}$

12 $\overline{DE}^2+\overline{BC}^2=\overline{BE}^2+\overline{CD}^2$이므로
$3^2+x^2=5^2+4^2$ $\therefore x^2=32$

13 $\overline{AB}^2+\overline{CD}^2=\overline{AD}^2+\overline{BC}^2$이므로
$8^2+6^2=x^2+9^2$ $\therefore x^2=19$

14 (색칠한 부분의 넓이)$=4\pi+8\pi=12\pi$

15 $12^2+\overline{AC}^2=15^2$이므로
$\overline{AC}^2=81$ $\therefore \overline{AC}=9$ ($\because \overline{AC}>0$)
$\therefore$ (색칠한 부분의 넓이)
$=\triangle ABC$
$=\frac{1}{2}\times 9\times 12=54$