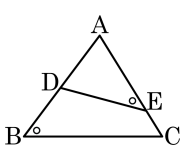
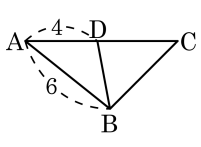
1. 다음 각 도형에서 닮음인 두 삼각형을 기호로 바르게 나타낸 것은?

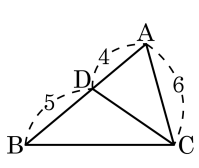
① $\triangle ABC \backsim \triangle ADE(\angle B = \angle E)$



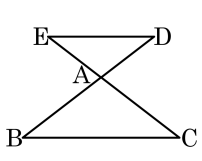
② $\triangle ABD \backsim \triangle BCD$



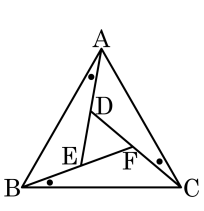
③ $\triangle ADC \backsim \triangle BDC$



④ $\triangle ABC \backsim \triangle ADE$



⑤ $\triangle ABC \backsim \triangle DEF(\angle BAE = \angle FBC = \angle DCA)$



해설

$\angle ABC = \angle DEF, \angle BAC = \angle EDF, \angle ACB = \angle DFE$ 이므로
$\triangle ABC \backsim \triangle DEF$(AA 닮음) 이다.

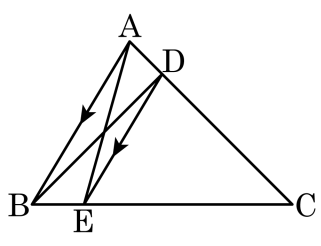
2. 다음 그림과 같이 $\overline{BC}$ // $\overline{DE}$ // $\overline{FG}$ 일 때, $x+y$ 의 값은?

① 11.7 ② 10.7 ③ 9.7
④ 8.7 ⑤ 7.7

해설

$10 : x = 8 : 6$
$8x = 60, x = 7.5$
$7.5 : 4 = 6 : y$
$7.5y = 24, y = 3.2$
$\therefore x + y = 7.5 + 3.2 = 10.7$

3. 다음 그림과 같은 $\triangle ABC$에서 $\overline{AB} // \overline{DE}$이고, $\triangle ABC = 30$, $\triangle DBC = 24$일 때, $\triangle ABE$의 넓이를 구하여라.



▶ 답:

▷ 정답: 6

해설

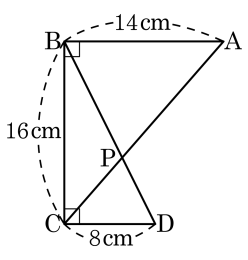
$\overline{AB} // \overline{DE}$이므로 $\triangle DBE$와 $\triangle AED$ 밑변과 높이가 같다. 따라서 $\triangle DBE = \triangle AED$이다.

$\triangle AEC = \triangle DEC + \triangle AED = \triangle DEC + \triangle DBE$

$= \triangle DBC = 24$

$\therefore \triangle ABE = \triangle ABC - \triangle AEC = 30 - 24 = 6$

4. 다음 그림에서 $\triangle PBC$ 의 넓이는?



① $\frac{447}{11}\,\mathrm{cm}^2$ ② $\frac{448}{11}\,\mathrm{cm}^2$ ③ $\frac{449}{11}\,\mathrm{cm}^2$
④ $\frac{500}{11}\,\mathrm{cm}^2$ ⑤ $\frac{552}{11}\,\mathrm{cm}^2$

해설

점P 에서 $\overline{BC}$에 내린 수선의 발을 H라고 하면

$\overline{PH} = \frac{14\times 8}{14+8} = \frac{112}{22} = \frac{56}{11}(\mathrm{cm})$

$\therefore (\triangle PBC\text{의 넓이}) = \frac{1}{2}\times 16\times \frac{56}{11} = \frac{448}{11}(\mathrm{cm}^2)$

5. 다음 그림에서 옳은 것은 무엇인가?

① $\triangle ABC \backsim \triangle AED$(SSS닮음)

② $\overline{AB} : \overline{AE} = \overline{BC} : \overline{ED}$

③ $\overline{BC} = 10\,\text{cm}$

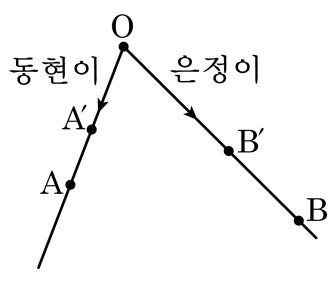
④ $\angle AED$ 의 대응각은 $\angle ACB$

⑤ $\overline{AE}$ 의 대응변은 $\overline{AC}$

해설

$\triangle ABC$와 $\triangle AED$에서
$\angle A$는 공통, $\overline{AB} : \overline{AE} = \overline{AC} : \overline{AD} = 3 : 1$
$\therefore$ $\triangle ABC \backsim \triangle AED$ (SAS 닮음)
$\therefore$ $\overline{AB} : \overline{AE} = \overline{BC} : \overline{ED}$

6. 동현이와 은정이는 다음 그림에서 출발점 O 에서 A, B 방향으로 각각 분속 3m/min, 5m/min 의 속력으로 달릴 때, 15 분 후의 동현이와 은정이의 위치를 각각 A′, B′ 이라고 하자. A′ 과 A 사이의 거리가 15m 일 때, B′ 과 B 사이의 거리는?

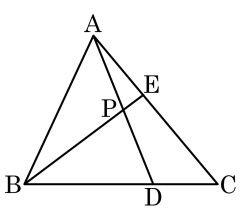


① 15m ② 20m ③ 25m ④ 30m ⑤ 35m

해설

A′ 와 B′, A 와 B 를 잇는 선을 그으면 동현이와 은정이의 속력은 일정하므로 두 선이 평행이다.
$\overline{OA'} = 45\text{m}$, $\overline{OB'} = 75\text{m}$ 이므로 $3 : 5 = 15 : \overline{B'B}$ 이다. 따라서 B′ 과 B 사이의 거리는 25m 이다.

7. 다음 그림 $\triangle ABC$에서 $\overline{DP} : \overline{PA} = \overline{BD} : \overline{DC} = 3 : 2$이다. $\triangle ABP$의 넓이가 $10\,\text{cm}^2$일 때, $\triangle ABC$의 넓이는?



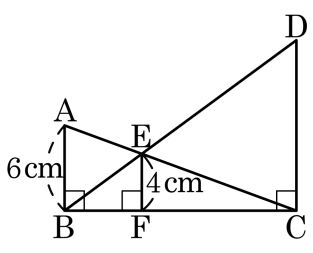
① $\frac{112}{5}\,\text{cm}^2$ ② $\frac{113}{4}\,\text{cm}^2$ ③ $\frac{125}{3}\,\text{cm}^2$
④ $\frac{123}{11}\,\text{cm}^2$ ⑤ $\frac{133}{7}\,\text{cm}^2$

해설

$\triangle ABD = 10 \times \frac{5}{2} = 25$

$\therefore\ \triangle ABC = 25 \times \frac{5}{3} = \frac{125}{3}$

8. 다음 그림에서 $\overline{AB}$, $\overline{EF}$, $\overline{DC}$는 모두 $\overline{BC}$에 수직이다. 이때, $\overline{DC}$의 길이는?

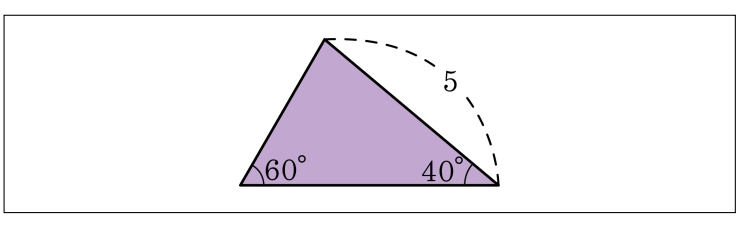


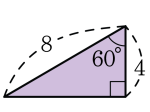
① 10 ② 11 ③ 12 ④ 13 ⑤ 14

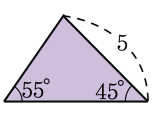
해설

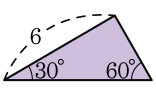
$\triangle ABC$와 $\triangle EFC$에 대하여 $\angle ABC = \angle EFC$, $\angle ECF$는 공통이므로 두 삼각형은 닮은 도형이고 닮음비는 $6 : 4 = 3 : 2$이다.
$\overline{BC} : \overline{FC} = 3 : 2$이므로 $\overline{BF} : \overline{FC} = 1 : 2$, $\overline{BC} : \overline{BF} = 3 : 1$이다.
$\triangle BCD$와 $\triangle BFE$에 대하여 $\angle B$는 공통, $\angle BFE = \angle BCD$이므로 두 삼각형은 닮은 도형이고 닮음비는 $3 : 1$이다.
$\therefore\ x = 4 \times 3 = 12$

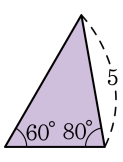
9. 다음 삼각형 중에서 주어진 삼각형과 닮은 삼각형은?

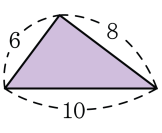


① 

② 

③ 

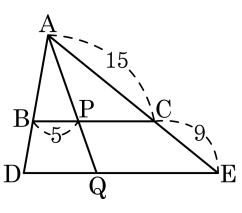
④ 

⑤ 

해설

④ AA 닮음

10. 그림과 같이 $\overline{BC}$ // $\overline{DE}$ 일 때, $\overline{DQ}$ 의 길이는?

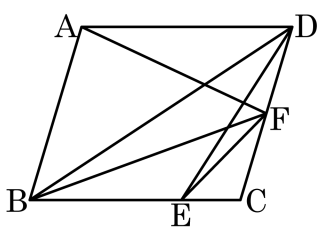


① 7 ② 8 ③ 9
④ 10 ⑤ 11

해설

$\overline{AQ} : \overline{AP} = \overline{AE} : \overline{AC} = 24 : 15 = 8 : 5$
$\overline{AQ} : \overline{AP} = \overline{DQ} : \overline{BP}$
$8 : 5 = \overline{DQ} : 5$
$\overline{DQ} = 8$

11. 다음 그림은 평행사변형 ABCD 이다. 다음 중 옳은 것을 모두 고르면?

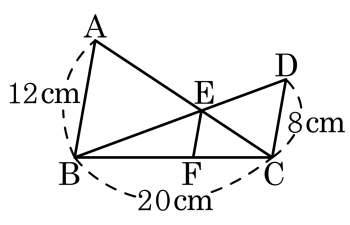


① $\triangle ADF = \triangle BDF$
② $\triangle DBF = \triangle DEF$
③ $\triangle BDE = \triangle BFE$
④ $\triangle ADB = \triangle AFB$
⑤ $\triangle BDE = \triangle EDC$

해설

① ○ $\triangle ADF = \triangle BDF$ ($\overline{DF}$ 가 공통)
② × $\triangle DBF = \triangle DEF$
③ × $\triangle BDE = \triangle BFE$
④ ○ $\triangle ADB = \triangle AFB$ ($\overline{AB}$ 가 공통)
⑤ × $\triangle BDE = \triangle EDC$

12. 다음 그림에서 $\overline{AB}//\overline{EF}//\overline{DC}$일 때, $\overline{EF}$의 길이는?

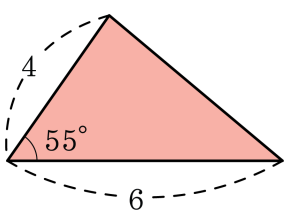


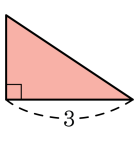
① $\frac{21}{5}$cm ② $\frac{22}{5}$cm ③ $\frac{23}{5}$cm
④ $\frac{24}{5}$cm ⑤ $\frac{26}{3}$cm

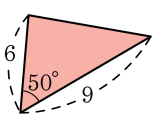
해설

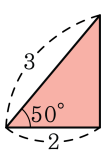
$\overline{AB}//\overline{EF}//\overline{DC}$ 이므로 $\overline{EF} = \frac{\overline{AB} \times \overline{DC}}{\overline{AB} + \overline{DC}} = \frac{12 \times 8}{12 + 8} = \frac{96}{20} = \frac{24}{5}$(cm) 이다.

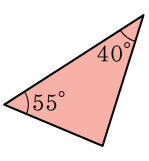
13. 다음 주어진 삼각형과 닮은 삼각형을 알맞게 짝지은 것은?

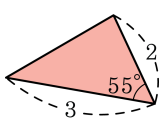


① 

② 

③ 

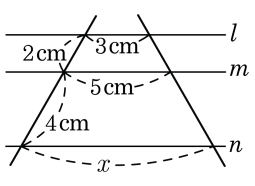
④ 

⑤ 

해설

⑤는 SAS 닮음이다.

14. 다음 그림에서 $\ell // m // n$ 이다. x 의 값은?



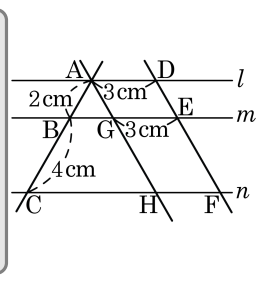
① 8cm ② 9cm

③ 10cm ④ 10.5cm

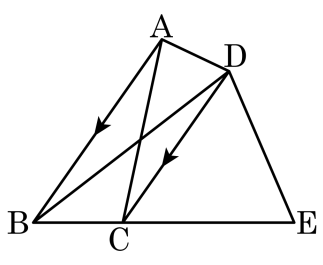
⑤ 11cm

해설

$\overline{DF}$ // $\overline{AH}$ 인 직선 AH 를 그으면
$\overline{BG} = 2\text{cm}$, $\overline{CH} = (x-3)\text{cm}$
$\overline{AB} : \overline{AC} = \overline{BG} : \overline{CH}$
$2 : 6 = 2 : (x-3)$
$x = 9(\text{cm})$



15. 다음 그림과 같이 $\overline{AB} /\!/ \overline{CD}$ 이고 $\triangle DCE = 30cm^2$, $\triangle DBC = 15cm^2$ 일 때, $\square ACED$ 의 넓이는?



① $25cm^2$ ② $30cm^2$ ③ $35cm^2$

④ $40cm^2$ ⑤ $45cm^2$

해설

$\overline{AB} /\!/ \overline{DC}$ 이므로 $\triangle ACD$ 와 $\triangle DBC$ 는 밑변 $\overline{CD}$ 가 같고 높이가 같으므로 넓이가 같다.

$\square ACED = \triangle DCE + \triangle ACD = \triangle DCE + \triangle DBC$

$\therefore \square ACED = 30 + 15 = 45(cm^2)$