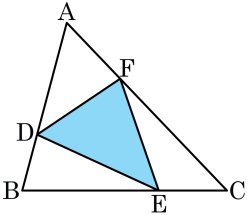
1. 다음 $\triangle ABC$ 에서 $\overline{AD} : \overline{DB} = \overline{BE} : \overline{EC} = \overline{CF} : \overline{FA} = 2 : 1$ 이다. $\triangle ADF = 14\,\mathrm{cm}^2$ 일 때, $\triangle DEF$ 의 넓이는?



① $18\,\mathrm{cm}^2$ ② $19\,\mathrm{cm}^2$ ③ $20\,\mathrm{cm}^2$

④ $21\,\mathrm{cm}^2$ ⑤ $22\,\mathrm{cm}^2$

해설

$\overline{CD}$ 를 그으면

$\triangle ADC = \frac{2}{3}\triangle ABC$

$\triangle ADF = \frac{1}{3}\triangle ADC = \frac{2}{9}\triangle ABC$

$\triangle ABC = 63\ (\mathrm{cm}^2)$

마찬가지로

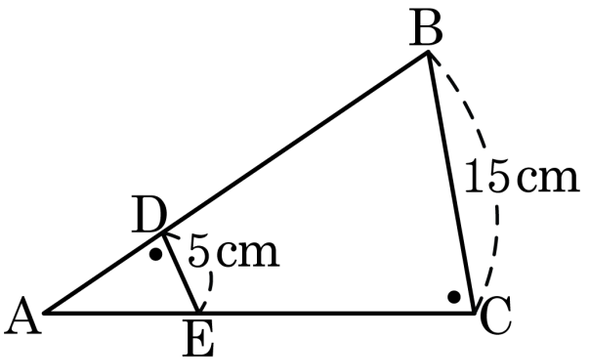
$\triangle DBE = \frac{2}{9}\triangle ABC$

$\triangle FEC = \frac{2}{9}\triangle ABC$

$\therefore\ \triangle DEF = \left(1 - \frac{2}{9} \times 3\right)\triangle ABC$

$= \frac{1}{3} \times 63 = 21\ (\mathrm{cm}^2)$

2. 다음 그림과 같은 $\triangle ABC$ 에서 $\angle ACB = \angle C$ 이고, $\overline{DE} = 5\,\text{cm}$, $\overline{BC} = 15\,\text{cm}$ 이다. $\triangle ACB = 18\,\text{cm}^2$ 일 때, 닮음인 두 삼각형을 찾아 닮음비를 말하고, $\triangle ACB$와 $\square DBCE$ 의 넓이의 비를 구하면?



① $\triangle ADE \backsim \triangle ACB,\ 1:3,\ 1:8$

② $\triangle ADE \backsim \triangle ACB,\ 1:4,\ 1:8$

③ $\triangle ADE \backsim \triangle ACB,\ 1:3,\ 3:15$

④ $\triangle ADE \backsim \triangle ACB,\ 1:4,\ 1:9$

⑤ $\triangle ADE \backsim \triangle ACB,\ 1:3,\ 1:9$

해설

$\triangle ADE \backsim \triangle ACB$ (AA 닮음)
이때, 닮음비는 $\overline{DE} : \overline{CB} = 5 : 15 = 1 : 3$ 이므로
$\triangle ADE : \triangle ABC = 1 : 9 = 18 : \triangle ABC$
$\therefore\ \triangle ABC = 162\,\text{cm}^2$ $\quad\quad$ $\therefore\ \square DBCE = 144\,\text{cm}^2$
따라서 $\triangle ADE : \square DBCE = 1 : 8$