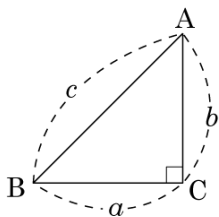


1. 다음은 다음 그림과 같은 직각삼각형 ABC 에 대한 설명이다. 옳지 않은 것은?



① $c = \frac{b}{\sin B}$

② $a = \frac{b}{\tan B}$

③ $a = c \cos B$

④ $c = a \sin (90^\circ - B)$

⑤ $c = b \sin B + a \cos B$

해설

① $\sin B = \frac{b}{c} \quad \therefore c = \frac{b}{\sin B}$

② $\tan B = \frac{b}{a} \quad \therefore a = \frac{b}{\tan B}$

③ $\cos B = \frac{a}{c} \quad \therefore a = c \cos B$

⑤ 점 C 에서 $\overline{AB}$ 에 내린 수선의 발을 H 라 하면 $\cos B = \frac{\overline{BH}}{a} \quad \therefore \overline{BH} = a \cos B$

$\cos(90 - B) = \frac{\overline{AH}}{b} \quad \therefore \overline{AH} = b \sin B$

$\therefore c = \overline{AH} + \overline{BH} = b \sin B + a \cos B$

2. 다음 삼각형의 넓이를 구하면?

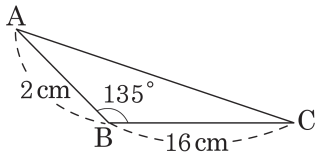
① $7\sqrt{2}\text{ cm}^2$

② $7\sqrt{3}\text{ cm}^2$

③ $8\sqrt{2}\text{ cm}^2$

④ $8\sqrt{3}\text{ cm}^2$

⑤ $9\sqrt{2}\text{ cm}^2$



해설

$$\begin{aligned}(\text{넓이}) &= \frac{1}{2} \times 2 \times 16 \times \sin(180^\circ - 135^\circ) \\ &= \frac{1}{2} \times 2 \times 16 \times \sin 45^\circ \\ &= \frac{1}{2} \times 2 \times 16 \times \frac{\sqrt{2}}{2} = 8\sqrt{2} (\text{cm}^2)\end{aligned}$$

3. 다음과 같은 $\triangle ABC$ 에서 $\overline{BC}$ 의 길이는?

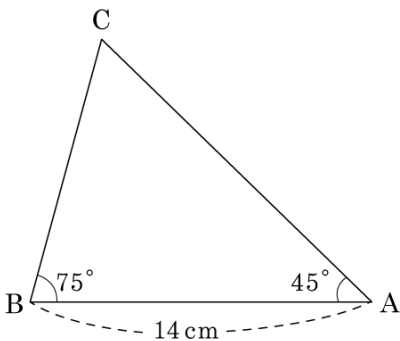
① $\frac{11\sqrt{6}}{3}\text{cm}$

② $4\sqrt{6}\text{cm}$

③ $\frac{13\sqrt{6}}{3}\text{cm}$

④ $\frac{14\sqrt{6}}{3}\text{cm}$

⑤ $5\sqrt{6}\text{cm}$



해설

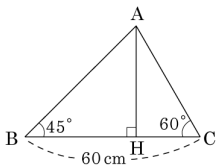
$\overline{BC} = x$ 라 하면,

$$14 \sin 45^\circ = x \sin 60^\circ$$

$$14 \times \frac{\sqrt{2}}{2} = x \times \frac{\sqrt{3}}{2}, 14\sqrt{2} = \sqrt{3}x$$

$$\therefore x = \frac{14\sqrt{2}}{\sqrt{3}} = \frac{14\sqrt{6}}{3}(\text{cm})$$

4. 다음 그림과 같은 $\triangle ABC$ 에서 $\angle B = 45^\circ$, $\angle C = 60^\circ$, $\overline{BC} = 60\text{cm}$ 일 때, $\overline{AH}$ 의 길이를 구하면?



① $30(2 - \sqrt{2}) \text{ cm}$

② $30(4 - \sqrt{2}) \text{ cm}$

③ $30(2 - \sqrt{3}) \text{ cm}$

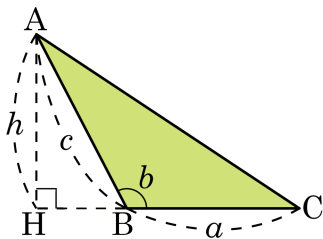
④ $30(3 - \sqrt{3}) \text{ cm}$

⑤ $30(4 - \sqrt{3}) \text{ cm}$

해설

$$\begin{aligned}
 \overline{AH} &= \frac{60}{\tan(90^\circ - 45^\circ) + \tan(90^\circ - 60^\circ)} \\
 &= \frac{60}{\tan 45^\circ + \tan 30^\circ} \\
 &= \frac{60}{1 + \frac{\sqrt{3}}{3}} \\
 &= \frac{180}{3 + \sqrt{3}} \\
 &= \frac{180(3 - \sqrt{3})}{9 - 3} \\
 &= 30(3 - \sqrt{3}) \text{ (cm)}
 \end{aligned}$$

5. 다음은 둔각삼각형에서 두 변의 길이와 그 끼인 각의 크기가 주어질 때, 그 삼각형의 넓이를 구하는 과정이다. □ 안에 알맞은 것은?



△ABC 에서 $\angle ABH = 180^\circ - \angle B$

$\sin(180^\circ - \angle B) = \frac{\square}{\square}$ 이므로 $h = \square \times \square$

$$\therefore \triangle ABC = \frac{1}{2}ah = \frac{1}{2}ac \sin(180^\circ - \angle B)$$

① $\frac{h}{a}, a, \tan(180^\circ - \angle B)$

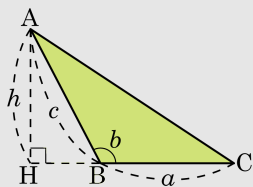
② $\frac{c}{a}, a, \sin(180^\circ - \angle B)$

③ $\frac{h}{c}, c, \cos(180^\circ - \angle B)$

④ $\frac{c}{h}, c, \sin(180^\circ - \angle B)$

⑤ $\frac{h}{c}, c, \sin(180^\circ - \angle B)$

해설



△ABC 에서 $\angle ABH = 180^\circ - \angle B$

$\sin(180^\circ - \angle B) = \frac{h}{c}$ 이므로

$$h = c \times \sin(180^\circ - \angle B)$$

따라서 $\triangle ABC = \frac{1}{2}ah = \frac{1}{2}ac \sin(180^\circ - \angle B)$ 이다.

6. 다음 그림의 삼각형의 넓이를 옳게 구한 것은?

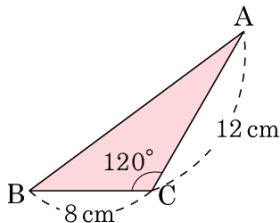
① 24cm^2

② $24\sqrt{2}\text{cm}^2$

③ $24\sqrt{3}\text{cm}^2$

④ 48cm^2

⑤ $48\sqrt{2}\text{cm}^2$



해설

$$\begin{aligned}\triangle ABC &= \frac{1}{2} \times \overline{AC} \times \overline{BC} \times \sin(180^\circ - 120^\circ) \\ &= \frac{1}{2} \times 12 \times 8 \times \frac{\sqrt{3}}{2} \\ &= 24\sqrt{3}(\text{cm}^2)\end{aligned}$$