

1. 다음과 같은 평행사변형의 넓이를 구하면?

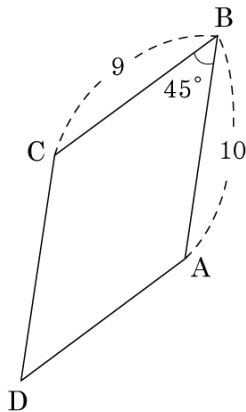
① $41\sqrt{2}$

② $42\sqrt{2}$

③ $43\sqrt{2}$

④ $44\sqrt{2}$

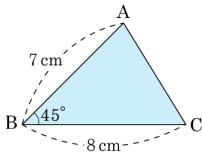
⑤ $45\sqrt{2}$



해설

$$\begin{aligned} 9 \times 10 \times \sin 45^\circ &= 9 \times 10 \times \frac{\sqrt{2}}{2} \\ &= 45\sqrt{2} \end{aligned}$$

2. 다음 그림의 $\triangle ABC$ 의 넓이는?



① $7\sqrt{2}\text{ cm}^2$

② $14\sqrt{2}\text{ cm}^2$

③ $21\sqrt{2}\text{ cm}^2$

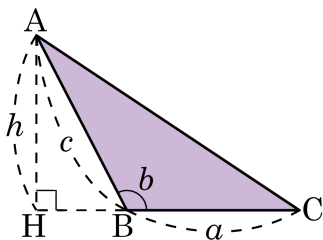
④ $28\sqrt{2}\text{ cm}^2$

⑤ $56\sqrt{2}\text{ cm}^2$

해설

$$\frac{1}{2} \times 7 \times 8 \times \sin 45^\circ = 28 \times \frac{\sqrt{2}}{2} = 14\sqrt{2}(\text{cm}^2)$$

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



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

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

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

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

① $\overline{AC}$

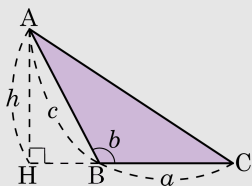
② $\overline{HB}$

③ a

④ c

⑤ h

해설



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

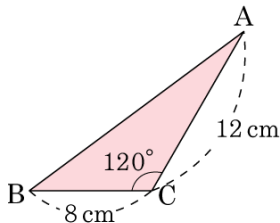
$$\sin(180^\circ - \angle B) = \frac{h}{c} \text{ 이므로}$$

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

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

4. 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 $48\sqrt{2}\text{cm}^2$

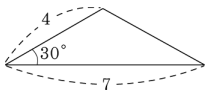


해설

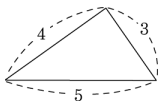
$$\begin{aligned}\triangle ABC &= \frac{1}{2} \times \overline{AC} \times \overline{BC} \times \sin(180^\circ - 120^\circ) \\ &= \frac{1}{2} \times 12 \times 8 \times \frac{\sqrt{3}}{2} \\ &= 24\sqrt{3}(\text{cm}^2)\end{aligned}$$

5. 다음 삼각형 중에서 넓이가 두 번째로 큰 것을 골라라. (단, $\sqrt{3} = 1.732$ 로 계산한다.)

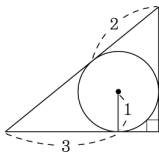
①



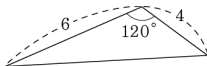
②



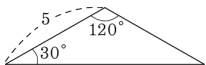
③



④



⑤



해설

$$\textcircled{1} S = \frac{1}{2} \times 4 \times 7 \times \frac{1}{2} = 7$$

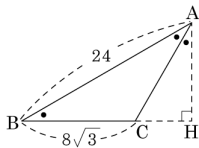
$$\textcircled{2} S = \frac{1}{2} \times 4 \times 3 = 6$$

$$\textcircled{3} S = \frac{1}{2} \times 4 \times 3 = 6$$

$$\textcircled{4} S = \frac{1}{2} \times 6 \times 4 \times \frac{\sqrt{3}}{2} = 6\sqrt{3} = 10.392$$

$$\textcircled{5} S = \frac{1}{2} \times 5 \times 5 \times \frac{\sqrt{3}}{2} = \frac{25\sqrt{3}}{4} = 10.825$$

6. 다음 그림과 같은 $\triangle ABC$ 의 넓이를 구하면?



① $48\sqrt{6}$

② $48\sqrt{5}$

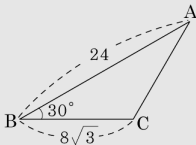
③ $48\sqrt{3}$

④ $48\sqrt{2}$

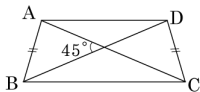
⑤ 48

해설

$$\begin{aligned} (\triangle ABC) &= \frac{1}{2} \times 24 \times 8\sqrt{3} \times \sin 30^\circ \\ &= \frac{1}{2} \times 24 \times 8\sqrt{3} \times \frac{1}{2} \\ &= 48\sqrt{3} \end{aligned}$$



7. 다음 그림과 같이 두 대각선이 이루는 각의 크기가 45° 인 등변사다리꼴 ABCD 의 넓이가 $36\sqrt{2}\text{cm}^2$ 일 때, $\overline{AC}$ 의 길이를 구하면?



① 8 cm

② 10 cm

③ 12 cm

④ 14 cm

⑤ 16 cm

해설

대각선 $\overline{AC} = \overline{BD} = x$ 라면

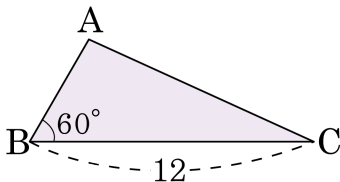
$$x \times x \times \frac{1}{2} \times \sin 45 = 36\sqrt{2}$$

$$x^2 \times \frac{1}{2} \times \frac{\sqrt{2}}{2} = 36\sqrt{2}$$

$$x^2 = 144$$

$$x = 12 \text{ (cm)}$$

8. 다음 그림과 같은 삼각형 ABC 의 넓이가 $30\sqrt{3}$ 일 때, $\overline{AB}$ 의 길이는?



① 14

② 13

③ 12

④ 11

⑤ 10

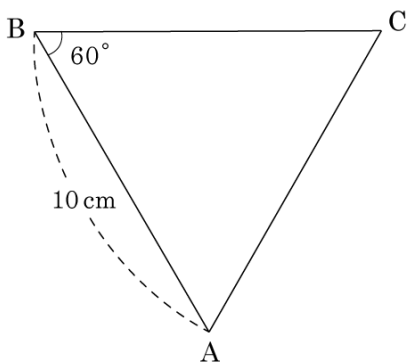
해설

$$\triangle ABC = \frac{1}{2} \times \overline{AB} \times 12 \times \sin 60^\circ = 30\sqrt{3}$$

$$6 \times \overline{AB} \times \frac{\sqrt{3}}{2} = 30\sqrt{3}$$

따라서 $\overline{AB} = 10$ 이다.

9. 다음 그림과 같은 삼각형 ABC가 있다. 넓이가 36cm^2 일 때, $\overline{BC}$ 의 길이는?



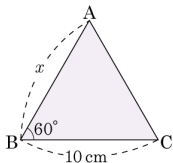
- ① $\frac{21\sqrt{3}}{5}\text{cm}$
- ② $\frac{22\sqrt{3}}{5}\text{cm}$
- ③ $\frac{23\sqrt{3}}{5}\text{cm}$
- ④ $\frac{24\sqrt{3}}{5}\text{cm}$
- ⑤ $\frac{26\sqrt{3}}{5}\text{cm}$

해설

$$\frac{1}{2} \times 10 \times \overline{BC} \times \sin 60^\circ = 36$$

$$\overline{BC} = 36 \times 2 \times \frac{1}{10} \times \frac{2\sqrt{3}}{3} = \frac{24\sqrt{3}}{5}(\text{cm})$$

10. 다음 그림에서 $\triangle ABC$ 의 넓이가 $50\sqrt{3}\text{cm}^2$ 일 때, x 의 값은?



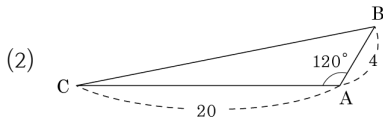
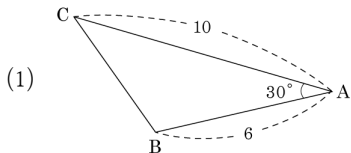
- ① 20cm ② 21cm ③ 22cm ④ 23cm ⑤ 24cm

해설

$$\begin{aligned} 50\sqrt{3} &= \frac{1}{2} \times x \times 10 \times \sin 60^\circ \\ &= \frac{1}{2} \times x \times 10 \times \frac{\sqrt{3}}{2} \\ &= \frac{5\sqrt{3}}{2}x \end{aligned}$$

$$\therefore x = 20(\text{cm})$$

11. 다음 그림을 보고 두 삼각형 ABC의 넓이는?



① (1) 12 (2) $18\sqrt{3}$

② (1) 12 (2) $20\sqrt{3}$

③ (1) 14 (2) $18\sqrt{3}$

④ (1) 14 (2) $20\sqrt{3}$

⑤ (1) 15 (2) $20\sqrt{3}$

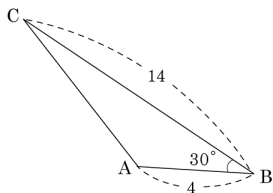
해설

$$\begin{aligned} (1) & \frac{1}{2} \times 10 \times 6 \times \sin 30^\circ \\ &= \frac{1}{2} \times 10 \times 6 \times \frac{1}{2} = 15 \end{aligned}$$

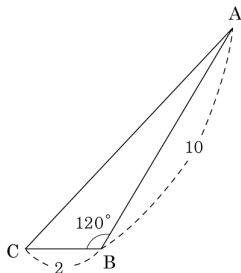
$$\begin{aligned} (2) & \frac{1}{2} \times 20 \times 4 \times \sin(180^\circ - 120^\circ) \\ &= \frac{1}{2} \times 20 \times 4 \times \sin 60^\circ \\ &= \frac{1}{2} \times 20 \times 4 \times \frac{\sqrt{3}}{2} = 20\sqrt{3} \end{aligned}$$

12. 다음 두 삼각형의 넓이를 구하면?

(1)



(2)



① (1)12, (2)10 $\sqrt{3}$

② (1)12, (2)12 $\sqrt{3}$

③ (1)14, (2)8 $\sqrt{3}$

④ (1)14, (2)9 $\sqrt{3}$

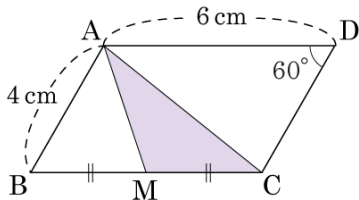
⑤ (1)14, (2)5 $\sqrt{3}$

해설

$$\begin{aligned} (1) (\text{넓이}) &= \frac{1}{2} \times 4 \times 14 \times \sin 30^\circ \\ &= \frac{1}{2} \times 4 \times 14 \times \frac{1}{2} = 14 \end{aligned}$$

$$\begin{aligned} (2) (\text{넓이}) &= \frac{1}{2} \times 2 \times 10 \times \sin(180^\circ - 120^\circ) \\ &= \frac{1}{2} \times 2 \times 10 \times \sin 60^\circ = 5\sqrt{3} \end{aligned}$$

13. 다음 그림과 같은 평행사변형 ABCD 에서 $\overline{BC}$ 의 중점을 M이라 하자. $\overline{AB} = 4\text{cm}$, $\overline{AD} = 6\text{cm}$, $\angle D = 60^\circ$ 일 때, $\triangle AMC$ 의 넓이는?



① $2\sqrt{2}\text{cm}^2$

② $4\sqrt{3}\text{cm}^2$

③ $3\sqrt{3}\text{cm}^2$

④ $6\sqrt{3}\text{cm}^2$

⑤ $6\sqrt{2}\text{cm}^2$

해설

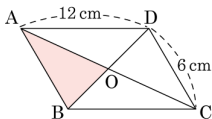
□ABCD 는 평행사변형이므로
 $\overline{BC} = \overline{AD} = 6\text{cm}$, $\angle B = \angle D = 60^\circ$

$$\therefore (\triangle ABC \text{의 넓이}) = \frac{1}{2} \times 4 \times 6 \times \sin 60^\circ = 6\sqrt{3}(\text{cm}^2)$$

그런데, $\triangle AMC = \frac{1}{2} \triangle ABC$ 이므로

$$\triangle AMC = \frac{1}{2} \times 6\sqrt{3} = 3\sqrt{3}(\text{cm}^2) \text{ 이다.}$$

14. 다음 그림과 같은 평행사변형 ABCD 에서 대각선 $\overline{AC}$, $\overline{BD}$ 의 교점을 O 라고 하자. $\angle BCD = 60^\circ$, $\overline{AD} = 12\text{cm}$, $\overline{CD} = 6\text{cm}$ 일 때, $\triangle ABO$ 의 넓이를 구하면?



① 9 cm^2

② 10 cm^2

③ $9\sqrt{2}\text{ cm}^2$

④ $9\sqrt{3}\text{ cm}^2$

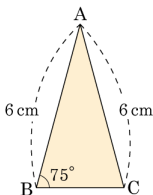
⑤ $10\sqrt{3}\text{ cm}^2$

해설

$$\begin{aligned}
 (\square ABCD \text{의 넓이}) &= 12 \times 6 \times \sin 60^\circ \\
 &= 12 \times 6 \times \frac{\sqrt{3}}{2} \\
 &= 36\sqrt{3} \text{ (cm}^2\text{)}
 \end{aligned}$$

$$\therefore \triangle ABO = 36\sqrt{3} \times \frac{1}{4} = 9\sqrt{3} \text{ (cm}^2\text{)}$$

15. 다음 그림과 같이 $\angle B = 75^\circ$, $\overline{AB} = \overline{AC} = 6\text{cm}$ 인 $\triangle ABC$ 의 넓이는?



① 6 cm^2

② $6\sqrt{3}\text{ cm}^2$

③ 9 cm^2

④ $9\sqrt{3}\text{ cm}^2$

⑤ $12\sqrt{3}\text{ cm}^2$

해설

$\triangle ABC$ 는 이등변삼각형이므로 $\angle B = \angle C = 75^\circ$
따라서 $\angle A = 180^\circ - (75^\circ + 75^\circ) = 30^\circ$ 이고,

$$\triangle ABC = \frac{1}{2} \times 6 \times 6 \times \sin 30^\circ = 9(\text{cm}^2) \text{ 이다.}$$