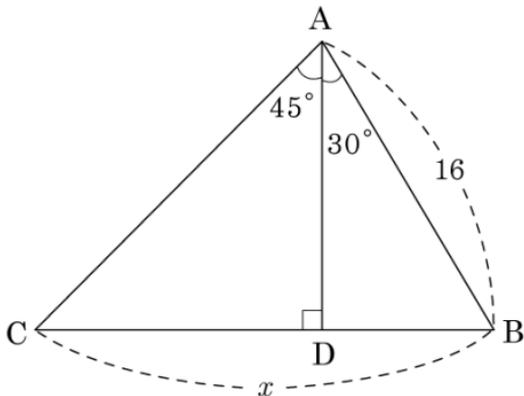


1. 다음 그림에서  $x$  의 값은?



①  $7 + 8\sqrt{2}$

②  $7 + 8\sqrt{3}$

③  $8 + 8\sqrt{2}$

④  $8 + 8\sqrt{3}$

⑤  $9 + 8\sqrt{2}$

해설

$$\overline{BD} = 16 \cos 60^\circ = 16 \times \frac{1}{2} = 8$$

$$\overline{DC} = \overline{AD} = 16 \sin 60^\circ = 16 \times \frac{\sqrt{3}}{2} = 8\sqrt{3}$$

$$\therefore x = \overline{BD} + \overline{CD} = 8 + 8\sqrt{3}$$

2. 다음 그림에서  $x + y$ 의 값은?

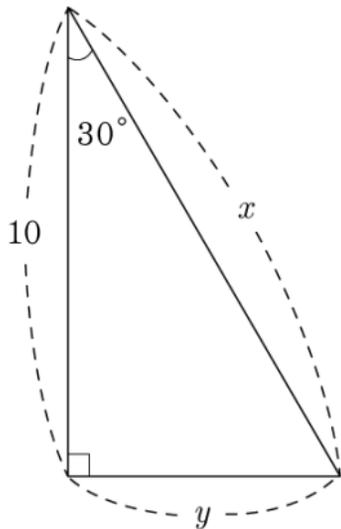
①  $8\sqrt{3}$

②  $9\sqrt{3}$

③  $10\sqrt{3}$

④  $11\sqrt{3}$

⑤  $12\sqrt{3}$



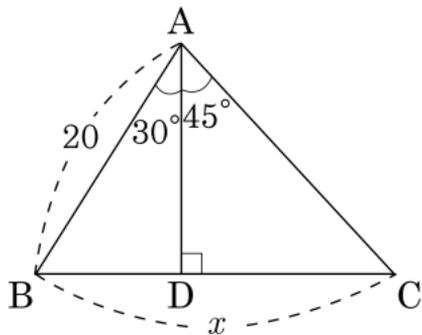
해설

$$x = \frac{10}{\cos 30^\circ} = \frac{20\sqrt{3}}{3}$$

$$y = 10 \times \tan 30^\circ = 10 \times \frac{1}{\sqrt{3}} = \frac{10\sqrt{3}}{3}$$

$$\therefore x + y = 10\sqrt{3}$$

3. 다음 그림에서  $x$  의 값을 구하여라.



▶ 답:

▶ 정답:  $10 + 10\sqrt{3}$

해설

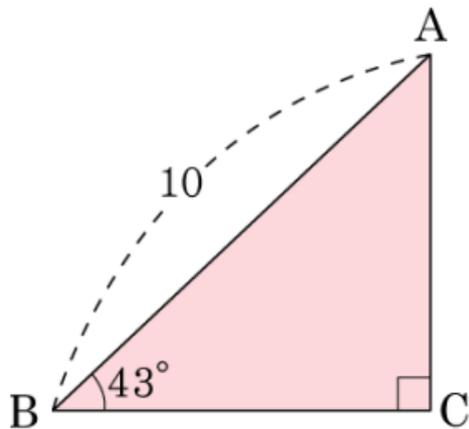
$$\overline{BD} = 20 \cos 60^\circ = 20 \times \frac{1}{2} = 10$$

$$\overline{DC} = \overline{AD} = 20 \sin 60^\circ = 20 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$$

$$\therefore x = \overline{BD} + \overline{CD} = 10 + 10\sqrt{3}$$

4. 다음 그림에서 직각삼각형 ABC의 넓이를 구하면? (단,  $\sin 43^\circ = 0.68$ ,  $\cos 43^\circ = 0.73$ ,  $\tan 43^\circ = 0.93$ )

- ① 7.3      ② 12.41      ③ 16.58  
④ 24.82      ⑤ 49.64



해설

$$\overline{AC} = 6.8,$$

$$\overline{BC} = 7.3$$

$$\therefore \triangle ABC = 6.8 \times 7.3 \times \frac{1}{2} = 24.82$$

5. 다음 그림과 같이 직각삼각형에서  $x$ 의 길이를 구하는 식은?

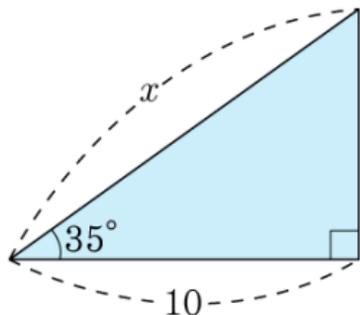
①  $x = \frac{10}{\cos 35^\circ}$

②  $x = 10 \tan 35^\circ$

③  $x = \frac{10}{\sin 35^\circ}$

④  $x = 10 \sin 35^\circ$

⑤  $x = 10 \cos 35^\circ$

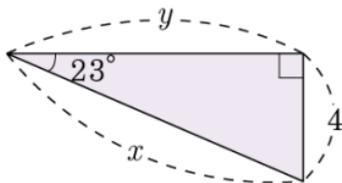


해설

$$\cos 35^\circ = \frac{10}{x} \text{ 이므로}$$

$$\therefore x = \frac{10}{\cos 35^\circ}$$

6. 다음 직각삼각형에서  $x$ ,  $y$ 의 값을 주어진 각과 변을 이용하여 삼각비로 나타낸 것은?



- ①  $x = 4 \tan 23^\circ$ ,  $y = \frac{4}{\sin 23^\circ}$   
 ②  $x = \frac{4}{\sin 23^\circ}$ ,  $y = \frac{4}{\tan 23^\circ}$   
 ③  $x = \frac{4}{\sin 23^\circ}$ ,  $y = \frac{4}{\cos 23^\circ}$   
 ④  $x = \frac{4}{\cos 23^\circ}$ ,  $y = 4 \sin 23^\circ$   
 ⑤  $x = 4 \tan 23^\circ$ ,  $y = \frac{4}{\sin 23^\circ}$

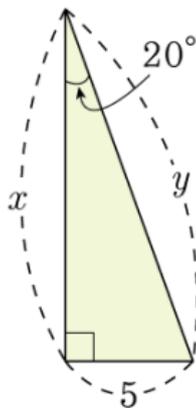
해설

$$\tan 23^\circ = \frac{4}{y}, \quad \sin 23^\circ = \frac{4}{x}, \quad \cos 23^\circ = \frac{y}{x} \quad \text{이므로 } x = \frac{4}{\sin 23^\circ},$$

$$y = \frac{4}{\tan 23^\circ}$$

7. 다음 직각삼각형에서  $x$ ,  $y$  의 값을 주어진 각과 변을 이용하여 삼각비로 나타낸 것은?

- ①  $x = 5 \sin 20^\circ$ ,  $y = \frac{5}{\sin 20^\circ}$   
 ②  $x = \frac{5}{\tan 20^\circ}$ ,  $y = 5 \sin 20^\circ$   
 ③  $x = \frac{5}{\tan 20^\circ}$ ,  $y = \frac{5}{\cos 20^\circ}$   
 ④  $x = \frac{5}{\cos 20^\circ}$ ,  $y = \frac{5}{\sin 20^\circ}$   
 ⑤  $x = \frac{5}{\tan 20^\circ}$ ,  $y = \frac{5}{\sin 20^\circ}$

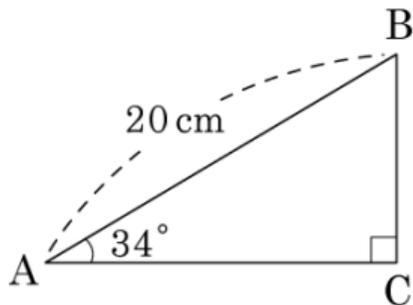


해설

$$\tan 20^\circ = \frac{5}{x}, \sin 20^\circ = \frac{5}{y}, \cos 20^\circ = \frac{x}{y} \text{ 이므로 } x = \frac{5}{\tan 20^\circ},$$

$$y = \frac{5}{\sin 20^\circ}$$

8. 다음 직각삼각형 ABC 에서  $\angle A = 34^\circ$  일 때, 높이  $\overline{BC}$  를 구하여라. (단,  $\sin 34^\circ = 0.5592$ ,  $\cos 34^\circ = 0.8290$  )



▶ 답: cm

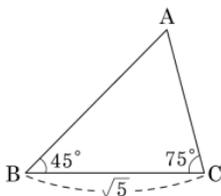
▷ 정답: 11.184 cm

해설

$$\sin 34^\circ = \frac{\overline{BC}}{20}$$

$$\therefore \overline{BC} = 20 \times 0.5592 = 11.184 \text{ (cm)}$$

9. 다음 그림의 삼각형 ABC 에서  $\angle B = 45^\circ$ ,  $\angle C = 75^\circ$ ,  $\overline{BC} = \sqrt{5}$  일 때,  $\overline{AC}$  의 길이를 구하여라



▶ 답 :

▶ 정답 :  $\frac{\sqrt{30}}{3}$

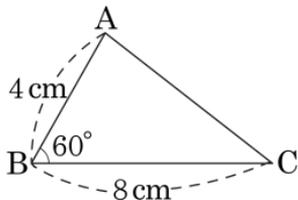
해설

$$\angle A = 180^\circ - 45^\circ - 75^\circ = 60^\circ$$

$$\overline{AC} \sin 60^\circ = \sqrt{5} \sin 45^\circ$$

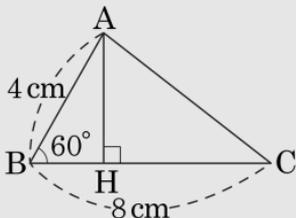
$$\begin{aligned} \overline{AC} &= \frac{\sqrt{5} \times \sin 45^\circ}{\sin 60^\circ} = \frac{\sqrt{5} \times \frac{\sqrt{2}}{2}}{\frac{\sqrt{3}}{2}} \\ &= \frac{\sqrt{10}}{\sqrt{3}} = \frac{\sqrt{30}}{3} \end{aligned}$$

10. 다음 그림과 같은  $\triangle ABC$  에서  $\overline{AB} = 4\text{cm}$   
 $, \overline{BC} = 8\text{cm} , \angle B = 60^\circ$  일 때,  $\overline{AC}$  의 길  
 이?



- ①  $4\sqrt{3}\text{cm}$                       ②  $5\sqrt{3}\text{cm}$   
 ③  $6\sqrt{3}\text{cm}$                       ④  $5\sqrt{2}\text{cm}$   
 ⑤  $7\text{cm}$

해설



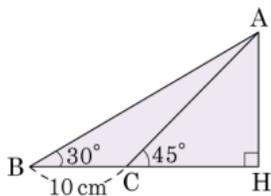
$$\begin{aligned} \overline{AH} &= 4 \sin 60^\circ \\ &= 4 \times \frac{\sqrt{3}}{2} = 2\sqrt{3} \end{aligned}$$

$$\begin{aligned} \overline{HC} &= 8 - \overline{BH} \\ &= 8 - 4 \cos 60^\circ \\ &= 8 - 2 = 6 \end{aligned}$$

$$\begin{aligned} \overline{AC}^2 &= \overline{AH}^2 + \overline{HC}^2 \text{ 이므로} \\ \overline{AC}^2 &= (2\sqrt{3})^2 + 6^2 = 12 + 36 = 48 \end{aligned}$$

$$\therefore x = 4\sqrt{3}(\text{cm})$$

11. 다음 그림에서  $\overline{BC} = 10\text{cm}$  이고  
 $\angle B = 30^\circ$ ,  $\angle ACH = 45^\circ$  일 때,  $\overline{AH}$  의 길이를 구하여라.



▶ 답:

▶ 정답:  $5(\sqrt{3} + 1)$

해설

$\overline{AH} = h$  라고 하면

$$\overline{AH} : \overline{BH} = 1 : \sqrt{3} = h : h + 10$$

$$\sqrt{3}h = h + 10, (\sqrt{3} - 1)h = 10$$

$$\therefore h = 5(\sqrt{3} + 1)$$

12. 다음 그림의 삼각형 ABC에서  $\triangle ABC$ 의 높이  $h$ 는?

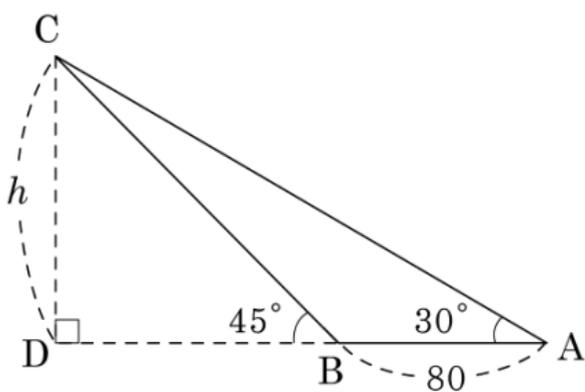
①  $30(\sqrt{3} + 1)$

②  $40(\sqrt{3} + 1)$

③  $50(\sqrt{3} + 1)$

④  $60(\sqrt{3} + 1)$

⑤  $80(\sqrt{3} + 1)$



해설

$$\begin{aligned}
 h &= \frac{80}{\tan(90^\circ - 30^\circ) - \tan(90^\circ - 45^\circ)} \\
 &= \frac{80}{\tan 60^\circ - \tan 45^\circ} = \frac{80}{\sqrt{3} - 1} = \frac{80(\sqrt{3} + 1)}{3 - 1} \\
 &= 40(\sqrt{3} + 1)
 \end{aligned}$$

13. 다음 삼각형의 넓이를 구하면?

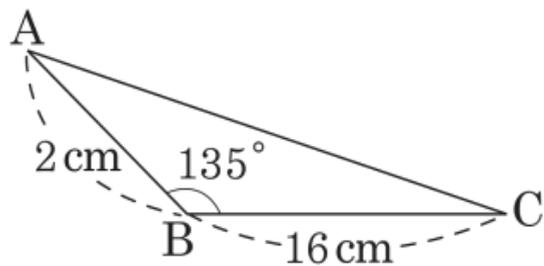
①  $7\sqrt{2}\text{ cm}^2$

②  $7\sqrt{3}\text{ cm}^2$

③  $8\sqrt{2}\text{ cm}^2$

④  $8\sqrt{3}\text{ cm}^2$

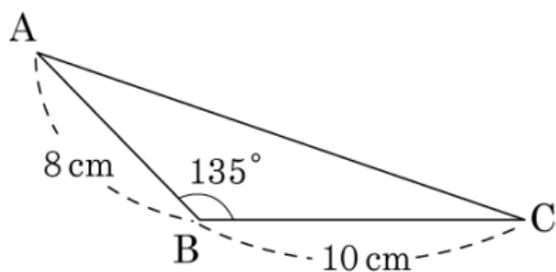
⑤  $9\sqrt{2}\text{ cm}^2$



해설

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

14. 다음 삼각형의 넓이를 구하여라.



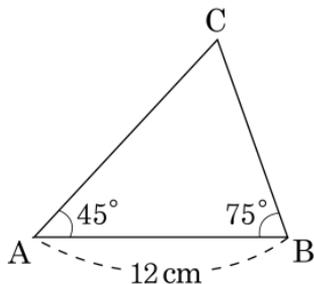
▶ 답:             $\text{cm}^2$

▷ 정답:  $20\sqrt{2}$   $\text{cm}^2$

해설

$$\begin{aligned}(\text{넓이}) &= \frac{1}{2} \times 8 \times 10 \times \sin(180^\circ - 135^\circ) \\ &= \frac{1}{2} \times 8 \times 10 \times \sin 45^\circ \\ &= \frac{1}{2} \times 8 \times 10 \times \frac{\sqrt{2}}{2} = 20\sqrt{2} (\text{cm}^2)\end{aligned}$$

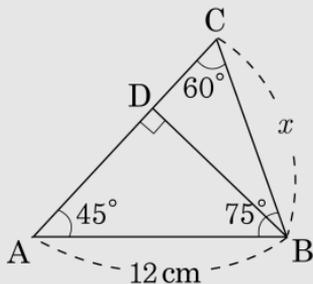
15. 다음  $\triangle ABC$  에서  $\angle A = 45^\circ$ ,  $\angle B = 75^\circ$ ,  
 $\overline{AB} = 12\text{cm}$  일 때,  $\overline{BC}$  의 길이를 구하여  
 라.



▶ 답 :                      cm

▷ 정답 :  $4\sqrt{6}$  cm

해설



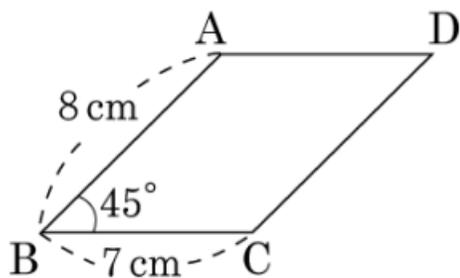
$$12 \sin 45^\circ = x \sin 60^\circ$$

$$12 \times \frac{\sqrt{2}}{2} = x \times \frac{\sqrt{3}}{2}, 12\sqrt{2} = \sqrt{3}x$$

$$\begin{aligned} \therefore x &= \frac{12\sqrt{2}}{\frac{\sqrt{3}}{2}} = \frac{12\sqrt{6}}{3} \\ &= 4\sqrt{6}(\text{cm}) \end{aligned}$$



17. 다음 그림과 같은 평행사변형 ABCD 의 넓이를 구하여라.



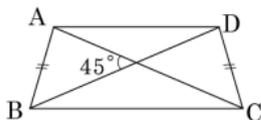
▶ 답:             $\text{cm}^2$

▶ 정답:  $28\sqrt{2}\text{cm}^2$

해설

$$\begin{aligned} 8 \times 7 \times \sin 45^\circ &= 8 \times 7 \times \frac{\sqrt{2}}{2} \\ &= 28\sqrt{2}(\text{cm}^2) \end{aligned}$$

18. 다음 그림과 같이 두 대각선이 이루는 각의 크기가  $45^\circ$  인 등변사다리꼴 ABCD 의 넓이가  $18\sqrt{2}\text{cm}^2$  일 때,  $\overline{AC}$  의 길이를 구하여라.



▶ 답:          cm

▶ 정답:  $6\sqrt{2}$  cm

해설

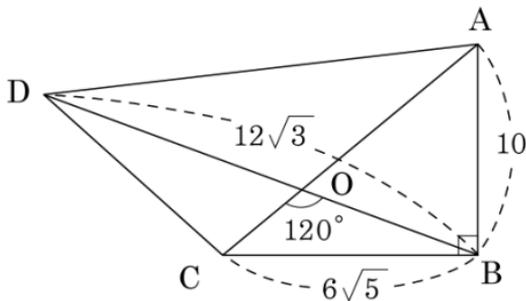
대각선  $\overline{AC} = \overline{BD} = x$  라면

$$x \times x \times \frac{1}{2} \times \sin 45^\circ = 18\sqrt{2}$$

$$x^2 \times \frac{1}{2} \times \frac{\sqrt{2}}{2} = 18\sqrt{2}$$

$$x^2 = 72 \quad \therefore x = 6\sqrt{2} (\text{cm})$$

19. 다음 사각형 ABCD 에서  $\overline{AB} = 10$ ,  $\overline{BC} = 6\sqrt{5}$ ,  $\overline{BD} = 12\sqrt{3}$  일 때,  $\square ABCD$  의 넓이는?



①  $16\sqrt{70}$

②  $18\sqrt{70}$

③  $20\sqrt{70}$

④  $21\sqrt{70}$

⑤  $24\sqrt{70}$

해설

$$\overline{AC} = \sqrt{10^2 + (6\sqrt{5})^2} = \sqrt{100 + 180} = 2\sqrt{70}$$

$\square ABCD$ 의 넓이

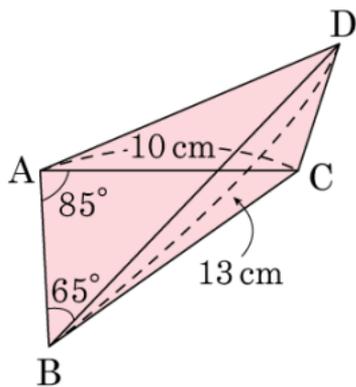
$$= \frac{1}{2} \times 12\sqrt{3} \times 2\sqrt{70} \times \sin(180^\circ - 120^\circ)$$

$$= \frac{1}{2} \times 12\sqrt{3} \times 2\sqrt{70} \times \sin 60^\circ$$

$$= \frac{1}{2} \times 12\sqrt{3} \times 2\sqrt{70} \times \frac{\sqrt{3}}{2} = 18\sqrt{70}$$

20. 다음 그림과 같이 대각선의 길이가  $\overline{AC} = 10\text{ cm}$ ,  $\overline{BD} = 13\text{ cm}$ 인 사각형 ABCD의 넓이를 구하여 빈 칸을 채워 넣어라.

사각형 ABCD의 넓이 = (    )  $\text{cm}^2$



▶ 답:

▶ 정답:  $\frac{65}{2}$

해설

$$\begin{aligned}
 S &= \frac{1}{2} \times 10 \times 13 \times \sin 30^\circ \\
 &= \frac{1}{2} \times 10 \times 13 \times \frac{1}{2} = \frac{65}{2} (\text{cm}^2)
 \end{aligned}$$