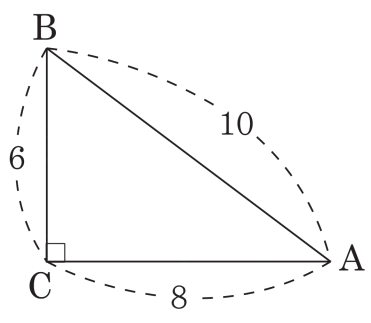
1. 다음과 같이 $\angle C = 90°$ 인 직각삼각형 $\triangle ABC$ 에서 $\sin A - \cos A$ 의 값으로 바른 것은?



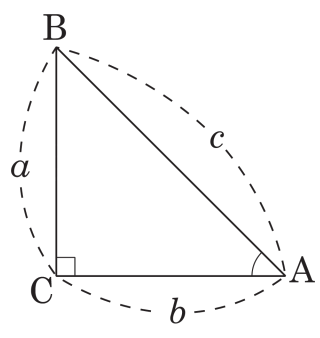
① $-\frac{1}{7}$ ② $-\frac{4}{5}$ ③ $-\frac{1}{5}$ ④ $-\frac{2}{3}$ ⑤ $-\frac{3}{4}$

해설

$\sin A = \frac{6}{10} = \frac{3}{5}$, $\cos A = \frac{8}{10} = \frac{4}{5}$

$\therefore \sin A - \cos A = \frac{3}{5} - \frac{4}{5} = -\frac{1}{5}$

2. 다음 그림을 보고, $\sin A$, $\cos A$, $\tan A$ 의 값을 각각 바르게 구한 것은?



① $\sin A = \frac{a}{b}$, $\cos A = \frac{b}{c}$, $\tan A = \frac{a}{c}$

② $\sin A = \frac{b}{c}$, $\cos A = \frac{a}{c}$, $\tan A = \frac{a}{b}$

③ $\sin A = \frac{a}{c}$, $\cos A = \frac{b}{c}$, $\tan A = \frac{a}{b}$

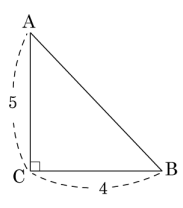
④ $\sin A = \frac{a}{c}$, $\cos A = \frac{c}{b}$, $\tan A = \frac{a}{b}$

⑤ $\sin A = \frac{a}{b}$, $\cos A = \frac{a}{c}$, $\tan A = \frac{b}{c}$

해설

$\sin A = \frac{\text{높이}}{\text{빗변}} = \frac{a}{c}$, $\cos A = \frac{\text{밑변}}{\text{빗변}} = \frac{b}{c}$, $\tan A = \frac{\text{높이}}{\text{밑변}} = \frac{a}{b}$

3. 다음 그림과 같은 직각삼각형 $\triangle ABC$ 에서 $\sin A$ 의 값은 얼마인가?



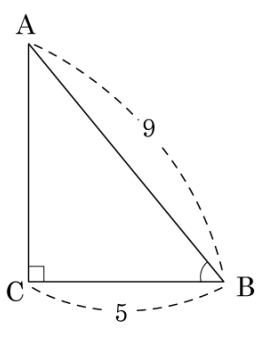
① $\frac{2\sqrt{41}}{41}$ ② $\frac{3\sqrt{41}}{41}$ ③ $\frac{4\sqrt{41}}{41}$
④ $\frac{5\sqrt{41}}{41}$ ⑤ $\frac{6\sqrt{41}}{41}$

해설

$\overline{AB} = \sqrt{5^2 + 4^2} = \sqrt{41}$

$\therefore \sin A = \frac{\overline{BC}}{\overline{AB}} = \frac{4}{\sqrt{41}} = \frac{4\sqrt{41}}{41}$

4. 다음과 같이 $\angle C$가 $90°$인 직각삼각형 $\triangle ABC$에서 $\cos B$의 값은 ?



① $\frac{5}{9}$ ② $\frac{9}{5}$ ③ $\frac{5}{8}$
④ $\frac{4}{5}$ ⑤ $\frac{2}{9}$

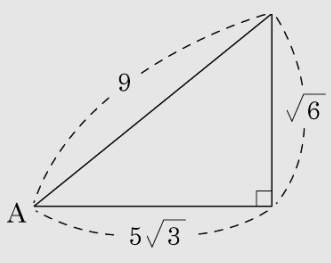
해설

$\cos B = \frac{\overline{BC}}{\overline{AB}} = \frac{5}{9}$

5. 한 직각삼각형에서 $\cos A = \frac{5\sqrt{3}}{9}$ 일 때, $\tan A$ 의 값은?

① $\frac{\sqrt{2}}{4}$ ② $\frac{\sqrt{2}}{5}$ ③ $\frac{\sqrt{2}}{6}$ ④ $\frac{\sqrt{2}}{7}$ ⑤ $\frac{\sqrt{2}}{8}$

해설

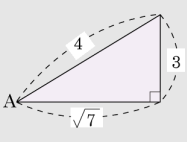


$\tan A = \frac{\sqrt{6}}{5\sqrt{3}} = \frac{\sqrt{2}}{5}$

6. $\sin A = \frac{3}{4}$ 일 때, $\cos A + \tan A$ 의 값은?

① $\frac{16\sqrt{7}}{27}$ ② $\frac{17\sqrt{7}}{27}$ ③ $\frac{2\sqrt{7}}{3}$
④ $\frac{19\sqrt{7}}{28}$ ⑤ $\frac{20\sqrt{7}}{27}$

해설



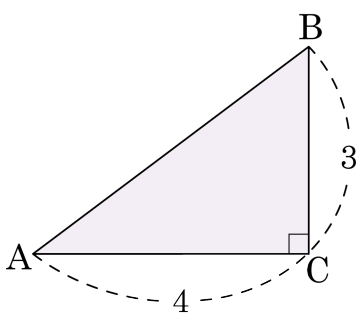
$\sin A = \frac{3}{4}$ 이므로

$\cos A = \frac{\sqrt{7}}{4}$

$\tan A = \frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$

$\therefore \cos A + \tan A = \frac{\sqrt{7}}{4} + \frac{3\sqrt{7}}{7} = \frac{19\sqrt{7}}{28}$

7. 삼각형 ABC 는 $\angle C = 90°$ 인 직각삼각형이다. $\overline{AC} = 4$, $\overline{BC} = 3$ 일 때, 다음 설명 중 옳은 것은?



① $\sin A = \frac{4}{5}$ ② $\cos A = \frac{3}{4}$ ③ $\tan A = \frac{4}{3}$

④ $\sin B = \frac{3}{5}$ ⑤ $\cos B = \frac{3}{5}$

해설

$\overline{AB} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$

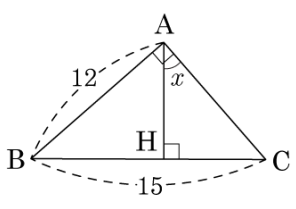
① $\sin A = \frac{3}{5}$

② $\cos A = \frac{4}{5}$

③ $\tan A = \frac{3}{4}$

④ $\sin B = \frac{4}{5}$

8. 다음 그림에서 $\angle BAC = 90°$ 이고, $\overline{BC} \perp \overline{AH}$ 이다. $\angle CAH = x$ 라 할 때, $\tan x$ 의 값은?



① $\frac{2}{3}$ ② $\frac{3}{4}$ ③ $\frac{4}{5}$ ④ $\frac{5}{6}$ ⑤ $\frac{5}{6}$

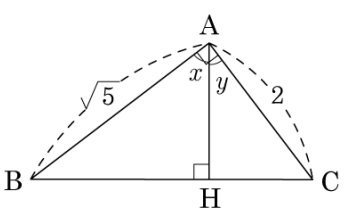
해설

$\overline{AC} = \sqrt{15^2 - 12^2} = 9$

$\triangle ABC \backsim \triangle HAC$ ($\because$ AA 닮음)

$x = \angle ABC$ 이므로 $\tan x = \frac{9}{12} = \frac{3}{4}$

9. 다음 그림과 같이 $\angle A = 90°$ 인 직각삼각형의 점 A 에서 빗변에 내린 수선의 발을 H 라 하고, $\overline{AB} = \sqrt{5}\,\text{cm}$, $\overline{AC} = 2\,\text{cm}$, $\angle BAH = x$, $\angle CAH = y$ 일 때, $\cos x + \cos y$ 의 값은?



① $\frac{\sqrt{5}}{2}$ ② $\frac{3\sqrt{5}}{2}$ ③ $\frac{2+\sqrt{5}}{3}$
④ $\frac{2+2\sqrt{5}}{3}$ ⑤ $\frac{2+3\sqrt{5}}{3}$

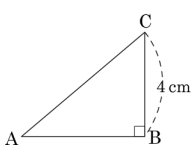
해설

$\triangle ABC \backsim \triangle HBA \backsim \triangle HAC$ 이므로
$\angle ABH = y$, $\angle ACH = x$

$\overline{BC} = \sqrt{2^2 + (\sqrt{5})^2} = 3$

$$\therefore \cos x + \cos y = \frac{\overline{AC}}{\overline{BC}} + \frac{\overline{AB}}{\overline{BC}} = \frac{2}{3} + \frac{\sqrt{5}}{3} = \frac{2+\sqrt{5}}{3}$$

10. 다음 그림과 같은 직각삼각형 ABC 에서 $\sin A = \frac{2}{3}$ 이고, $\overline{BC}$ 가 4cm 일 때, $\overline{AC}$ 의 길이는?

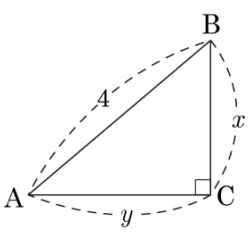


① 4 cm ② 6 cm ③ 8 cm ④ 9 cm ⑤ 12 cm

해설

$\sin A = \frac{\overline{BC}}{\overline{AC}} = \frac{4}{\overline{AC}} = \frac{2}{3}$ 이므로 $12 = 2 \times \overline{AC}$ 이다.
따라서 $\overline{AC} = 6$cm 이다.

11. $\sin A = \dfrac{\sqrt{2}}{2}$ 인 직각삼각형 ABC 에서 $x+y$ 의 값은? (단, $0° < A < 90°$)



① $\sqrt{2}+2$ ② $2\sqrt{2}-2$ ③ $4\sqrt{2}$

④ $4\sqrt{2}-2$ ⑤ $5\sqrt{2}-2$

해설

$\sin A = \dfrac{x}{4} = \dfrac{\sqrt{2}}{2} \Rightarrow x = 2\sqrt{2}$

$y = \sqrt{4^2 - (2\sqrt{2})^2} = 2\sqrt{2}$

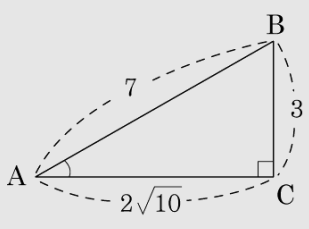
따라서 $x = 2\sqrt{2},\ y = 2\sqrt{2}$ 이다.

12. $0° < A < 90°$이고, $\sin A = \frac{3}{7}$일 때, $\cos A$의 값으로 적절한 것은?

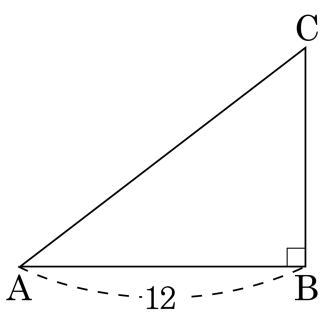
① $\frac{\sqrt{10}}{7}$　② $\frac{2\sqrt{10}}{7}$　③ $\frac{3\sqrt{10}}{7}$
④ $\frac{4\sqrt{10}}{7}$　⑤ $\frac{5\sqrt{10}}{7}$

해설

$\sin A = \frac{3}{7}$이면
$\overline{AC} = \sqrt{49-9} = \sqrt{40} = 2\sqrt{10}$
$\cos A = \frac{2\sqrt{10}}{7}$



13. 다음 그림과 같이 $\angle B = 90°$ 인 직각삼각형 ABC 에서 $\overline{AB} = 12$, $\tan A = \frac{3}{4}$ 일 때, $\cos A + \cos C$ 의 값은?



① $\frac{5}{12}$ ② $\frac{7}{12}$ ③ $\frac{3}{5}$ ④ $\frac{4}{5}$ ⑤ $\frac{7}{5}$

해설

$\tan A = \frac{\overline{BC}}{12} = \frac{3}{4}$, $\overline{BC} = 9$

$\overline{AC} = \sqrt{12^2 + 9^2} = \sqrt{225} = 15$

$\therefore \cos A + \cos C = \frac{12}{15} + \frac{9}{15} = \frac{21}{15} = \frac{7}{5}$

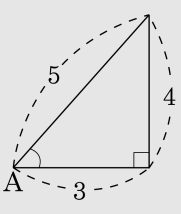
14. $\tan A = \frac{4}{3}$ 일 때, $\cos A + \sin A$ 의 값은? (단, $0° < A < 90°$)

① $\frac{7}{5}$ ② $\frac{8}{5}$ ③ $\frac{3}{8}$ ④ $\frac{5}{8}$ ⑤ $\frac{7}{8}$

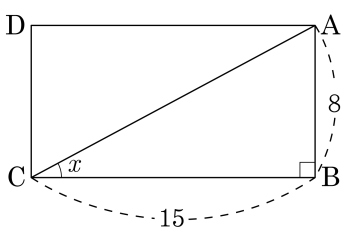
해설

$\tan A = \frac{8}{6}$ 이므로

$\therefore \ \cos A + \sin A = \frac{3}{5} + \frac{4}{5} = \frac{7}{5}$



15. 그림과 같은 직사각형에서 $2\sin x + \cos x$의 값은?



① $\frac{30}{17}$ ② $\frac{31}{17}$ ③ $\frac{32}{17}$ ④ $\frac{33}{17}$ ⑤ $\frac{34}{17}$

해설

$\overline{AC} = \sqrt{8^2 + 15^2} = \sqrt{289} = 17$

$\therefore\ 2\sin x + \cos x = 2 \times \frac{8}{17} + \frac{15}{17} = \frac{31}{17}$