Exact values from special triangles

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Find $\sin 30^\circ$ exactly. [2 marks]

The shorter leg is half the hypotenuse.

Answer: $\frac{1}{2}$

2. Find $\cos 45^\circ$ exactly. [2 marks]

$\cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$.

Answer: $\frac{\sqrt{2}}{2}$

3. Find $\tan 30^\circ$ exactly. [2 marks]

$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$.

Answer: $\frac{\sqrt{3}}{3}$

4. A right triangle has hypotenuse 10 cm and an angle of 45°. Find the opposite leg exactly. [3 marks]

$x = 10\sin 45^\circ = 10(\frac{\sqrt{2}}{2}) = 5\sqrt{2}$ cm.

Answer: $5\sqrt{2}$ cm

5. Evaluate $2\cos 60^\circ + \sin 30^\circ$ exactly. [2 marks]

$2(\frac{1}{2}) + \frac{1}{2} = \frac{3}{2}$.

Answer: $\frac{3}{2}$

6. Are $\sin 60^\circ$ and $\tan 60^\circ$ equal? Give exact values to justify. [2 marks]

$\sin 60^\circ = \frac{\sqrt{3}}{2}$ whereas $\tan 60^\circ = \sqrt{3}$.

The ratios have different denominators.

Answer: No.