

Special Right Triangles and Right Triangle Trigonometry (6.1)

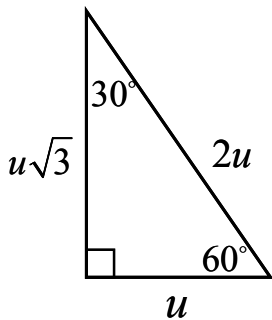
Simplifying Square Roots: Simplify. Remember you may not have a radical in the denominator.

1) $\frac{12}{\sqrt{2}} = \frac{12 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{12\sqrt{2}}{2}$
 $\boxed{6\sqrt{2}}$

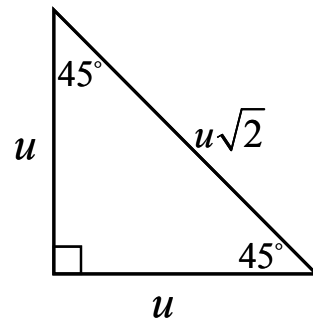
2) $\frac{2}{\sqrt{3}} = \frac{2 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{2\sqrt{3}}{3}$
 $\boxed{\frac{2\sqrt{3}}{3}}$

Special Right Triangles

30, 60, 90 Triangle

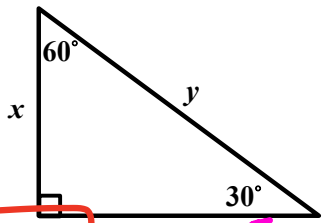


45, 45, 90 Triangle



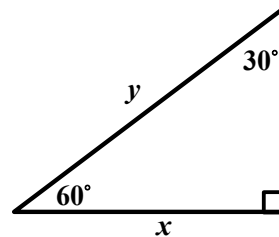
Using Special Right Triangles: Use the rules for a 30, 60, 90 triangle or a 45, 45, 90 triangle to solve for x and y.

3)



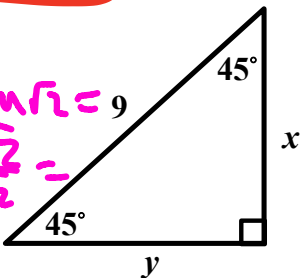
$x = \frac{7\sqrt{3}}{3}$
 $y = \frac{14\sqrt{3}}{3}$
 $7 = u\sqrt{3}$
 $u = \frac{7 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{7\sqrt{3}}{3}$

4)



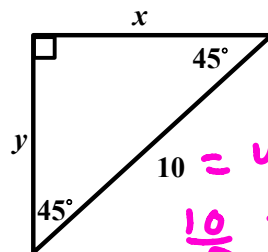
$6 = u\sqrt{3}$
 $u = \frac{6 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{6\sqrt{3}}{3}$
 $x = 2\sqrt{3}$
 $y = 4\sqrt{3}$

5)



$u\sqrt{2} = 9$
 $u = \frac{9 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{9\sqrt{2}}{2}$
 $x, y = \frac{9\sqrt{2}}{2}$

6)



$10 = u\sqrt{2}$
 $\frac{10 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = u$
 $5\sqrt{2}$
 $x, y = 5\sqrt{2}$

The Pythagorean Theorem

$$a^2 + b^2 = c^2$$

reciprocal

Trigonometric Identities in Right Triangles (SOH CAH TOA)

$$\sin \theta = \frac{o}{h}$$



$$\csc \theta = \frac{h}{o}$$

$$\cos \theta = \frac{a}{h}$$



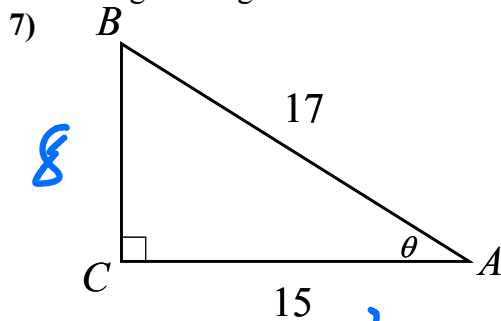
$$\sec \theta = \frac{h}{a}$$

$$\tan \theta = \frac{o}{a}$$



$$\cot \theta = \frac{a}{o}$$

Using The Pythagorean Theorem: Use the Pythagorean Theorem to find the length of the missing side of each right triangle. Then find the value of each of the six trigonometric functions of θ .



$$17^2 = 15^2 + x^2$$

$$289 = 225 + x^2$$

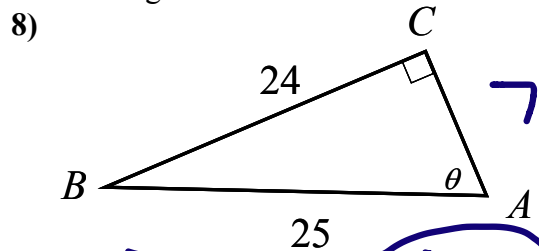
$$64 = x^2$$

$$x = 8$$

$$\sin \theta = \frac{8}{17}$$

$$\cos \theta = \frac{15}{17}$$

$$\tan \theta = \frac{8}{15}$$



$$\sin \theta = \frac{24}{25}$$

$$\cos \theta = \frac{7}{25}$$

$$\tan \theta = \frac{24}{7}$$

$$\csc \theta = \frac{25}{24}$$

$$\sec \theta = \frac{25}{7}$$

$$\cot \theta = \frac{7}{24}$$

$$\csc \theta = \frac{17}{8}$$

$$\sec \theta = \frac{17}{15}$$

$$\cot \theta = \frac{15}{8}$$