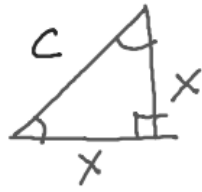


45-45-90 Triangle



$$x^2 + x^2 = c^2$$

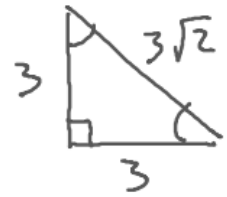
$$\sqrt{2x^2} = \sqrt{c^2}$$

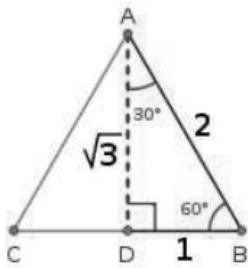
$$c = x\sqrt{2}$$

45-45-90 rt Δ

Legs are \cong

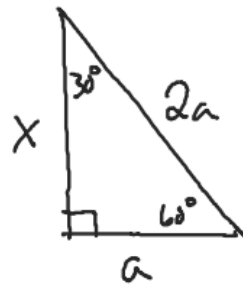
Hypotenuse is Leg $\cdot \sqrt{2}$





$$(2a)^2 = 2^2 a^2 + 4a^2$$

30-60-90 Triangle



$$x^2 + a^2 = (2a)^2$$

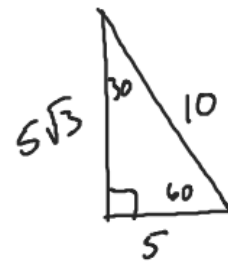
$$x^2 + a^2 = 4a^2$$

$$\sqrt{x^2} = \sqrt{3a^2}$$

$$x = a\sqrt{3}$$

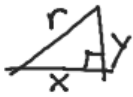
Hypotenuse is Short Leg times 2

Long Leg is short Leg times $\sqrt{3}$



What you'll Learn About

- Trig functions of any angle/Trig functions of real numbers
- Periodic Functions/The Unit Circle

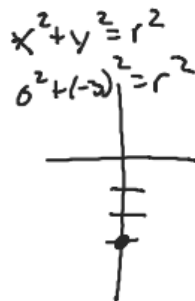
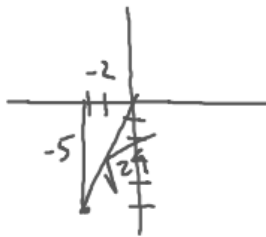


$$x^2 + y^2 = r^2$$

$$\sin \theta = \frac{y}{r}$$

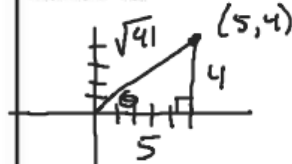
$$\cos \theta = \frac{x}{r}$$

$$\tan \theta = \frac{y}{x}$$



Point P is on the terminal side of angle θ . Evaluate the six trigonometric functions for θ .

A) (5, 4)



$$\sin \theta = \frac{4}{\sqrt{41}}$$

$$\cos \theta = \frac{5}{\sqrt{41}}$$

$$\tan \theta = \frac{4}{5}$$

C) (-2, -5)

$$\sin \theta = \frac{-5}{\sqrt{29}}$$

$$\cos \theta = \frac{-2}{\sqrt{29}}$$

$$\tan \theta = \frac{5}{2}$$

$$\csc \theta = \frac{\sqrt{41}}{4}$$

$$\sec \theta = \frac{\sqrt{41}}{5}$$

$$\cot \theta = \frac{5}{4}$$

$$\csc \theta = \frac{\sqrt{29}}{-5}$$

$$\sec \theta = \frac{\sqrt{29}}{-2}$$

$$\cot \theta = \frac{2}{5}$$

E) (0, -3) $r = 3$

$$\sin \theta = \frac{y}{r} = \frac{-3}{3} = -1$$

$$\cos \theta = \frac{x}{r} = \frac{0}{3} = 0$$

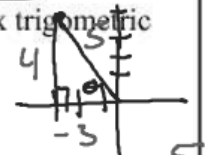
$$\tan \theta = \frac{y}{x} = \frac{-3}{0} = \text{undefined}$$

$$\csc \theta = -1$$

$$\sec \theta = \text{undefined}$$

$$\cot \theta = \frac{0}{-3} = 0$$

B) (-3, 4)



$$\sin \theta = \frac{4}{5}$$

$$\cos \theta = \frac{-3}{5}$$

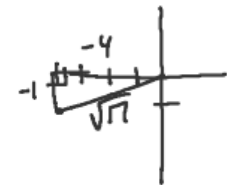
$$\tan \theta = \frac{-4}{3}$$

$$\csc \theta = \frac{5}{4}$$

$$\sec \theta = \frac{5}{-3}$$

$$\cot \theta = \frac{-3}{4}$$

D) (-4, -1)



F) (3, 0) $r = 3$

$$\sin \theta = \frac{0}{3} = 0$$

$$\cos \theta = \frac{3}{3} = 1$$

$$\tan \theta = \frac{0}{3} = 0$$

$$\csc \theta = \frac{3}{0} = \text{undefined}$$

$$\sec \theta = 1$$

$$\cot \theta = \frac{3}{0} = \text{undefined}$$

Unit Circle, Fill in the blank

