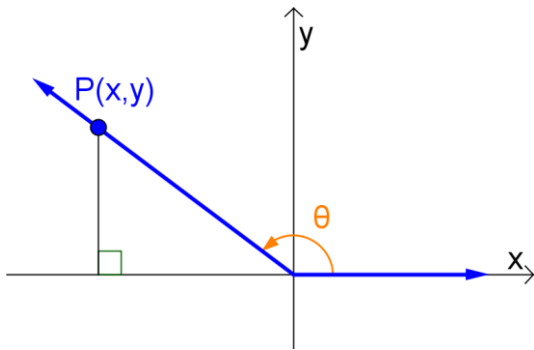


Trigonometric Functions



Trigonometric functions definitions:

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

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

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

$$(\text{Note: } r = \sqrt{x^2 + y^2})$$

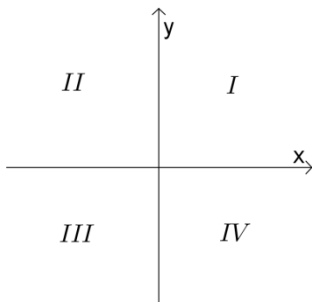
Ex 1.

The terminal side of an angle θ in standard position passes through the point $(3,7)$. Find the values of the six trigonometric functions of angle θ .

Ex 2.

The terminal side of an angle θ in standard position passes through the point $(-3, -4)$. Find the values of the six trigonometric functions of angle θ .

Quadrants

**Ex 3.**

Find the values of the six trigonometric functions for an angle of 90° .

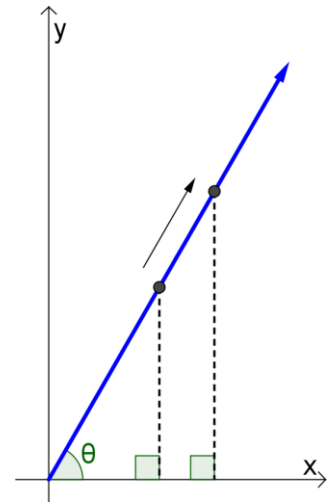
Ex 4.

Evaluate $\sin 540^\circ$.

Ex 5.

Evaluate $\sec(-450^\circ)$.

Note: The values of the trig functions only depend on the angle θ , not on the point on the terminal side. Why? Because corresponding sides of similar triangles are proportional.



Practice

1. The terminal side of an angle θ in standard position passes through the point $(1, -\sqrt{3})$. Find the values of the six trigonometric functions of angle θ .

2. Find the values of the six trigonometric functions for an angle of 630° . (Hint: to figure out where 630° is, find the nice coterminal angle between 0° and 360° .)

3. Find the values of the six trigonometric functions for an angle θ in standard position with terminal side through $(-3,0)$.
4. Evaluate the following trig functions.
- a) $\cos(-270^\circ)$
- b) $\tan 180^\circ$
5. Is $\frac{y}{r}$ positive or negative in Quadrant III?
6. Is $\frac{y}{x}$ positive or negative in Quadrant II?
7. Is $\frac{x}{r}$ positive or negative in Quadrant IV?
8. What is the sign of all six trig functions in Quadrant I?