

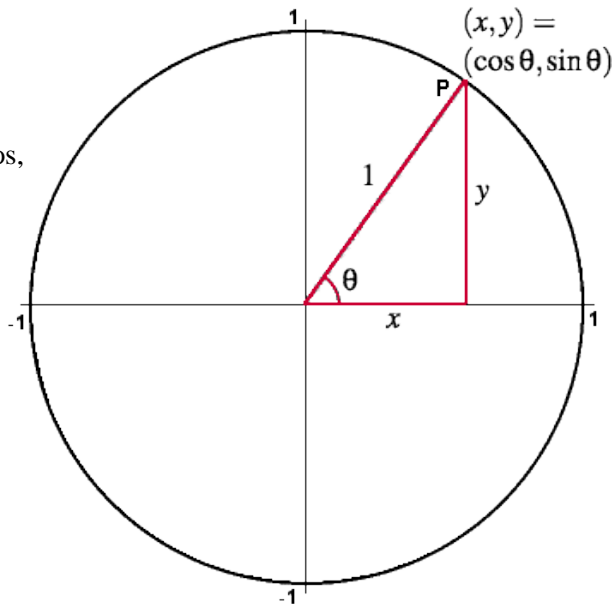
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Objective:

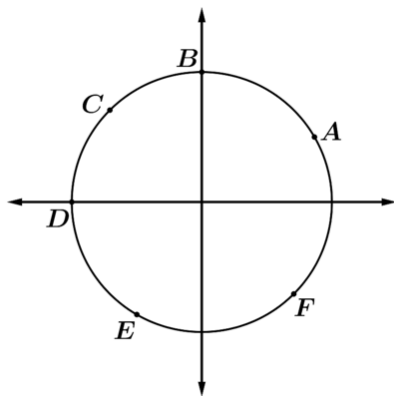
## Finding Sine, Cosine, and Tangent on the Unit Circle

You can use the  $(x,y)$  coordinates on the unit circle to solve for the sin, cos, and tan.

$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{y}{1} = y$	$\csc \theta = \frac{1}{y} = \frac{1}{\sin \theta}$
$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{x}{1} = x$	$\sec \theta = \frac{1}{x} = \frac{1}{\cos \theta}$
$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{y}{x}$	$\cot \theta = \frac{1}{\tan \theta} = \frac{x}{y}$



**Example:** Refer to the diagram below. For the indicated point, tell if the value for each trigonometric function is **positive, negative, neither (zero), or undefined**. Write the value of the trig function using  $x$  and/or  $y$ .



- |  |  |
|--|--|
| <p>a) <math>\sin A</math><br/>Pos, Neg, Zero, or Und?<br/>Value: _____</p>   | <p>b) <math>\cos C</math><br/>Pos, Neg, Zero, or Und?<br/>Value: _____</p>   |
| <p>c) <math>\tan C</math><br/>Pos, Neg, Zero, or Und?<br/>Value: _____</p>   | <p>d) <math>\cot D</math><br/>Pos, Neg, Zero, or Und?<br/>Value: _____</p>   |
| <p>e) <math>\tan D =</math><br/>Pos, Neg, Zero, or Und?<br/>Value: _____</p> | <p>f) <math>\sec F =</math><br/>Pos, Neg, Zero, or Und?<br/>Value: _____</p> |

State the angle in **degrees** represented by the given coordinate point.

- |   |              |   |
|---|--------------|---|
| 1. $(\frac{\sqrt{3}}{2}, -\frac{1}{2})$ | 2. $(-1, 0)$ | 3. $(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ |
|---|--------------|---|

State the angle in **radians** represented by the given coordinate point.

- |   |             |   |
|---|-------------|---|
| 1. $(\frac{\sqrt{3}}{2}, -\frac{1}{2})$ | 2. $(0, 1)$ | 3. $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$ |
|---|-------------|---|

Practice: Draw the angle. Use the unit circle to identify the requested trig ratios.

1.  $\sin 30^\circ =$  \_\_\_\_\_

$\cos 30^\circ =$  \_\_\_\_\_

$\tan 30^\circ =$  \_\_\_\_\_

3.  $\sin -\frac{\pi}{3} =$  \_\_\_\_\_

$\cos -\frac{\pi}{3} =$  \_\_\_\_\_

$\tan -\frac{\pi}{3} =$  \_\_\_\_\_

2.  $\sin -150^\circ =$  \_\_\_\_\_

$\cos -150^\circ =$  \_\_\_\_\_

$\tan -150^\circ =$  \_\_\_\_\_

4.  $\sin \frac{\pi}{2} =$  \_\_\_\_\_       $\csc \frac{\pi}{2} =$  \_\_\_\_\_

$\cos \frac{\pi}{2} =$  \_\_\_\_\_       $\sec \frac{\pi}{2} =$  \_\_\_\_\_

$\tan \frac{\pi}{2} =$  \_\_\_\_\_       $\cot \frac{\pi}{2} =$  \_\_\_\_\_

Find the exact value of each trig function using the unit circle as a reference.

1.  $\tan \pi$

2.  $\cot \pi$

3.  $\csc 150^\circ$

4.  $\csc -150^\circ$

5.  $\sec 30^\circ$

6.  $\sec \frac{3\pi}{4}$

7.  $\csc 180^\circ$

8.  $\sec \frac{3\pi}{2}$