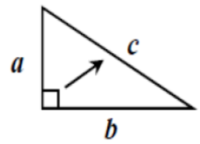
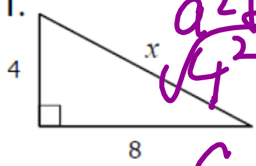
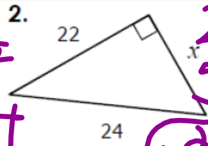
<table>
<tr><th>Main Ideas</th><th colspan="2">Notes</th></tr>
<tr><td rowspan="3">PYTHAGOREAN THEOREM

3</td><td colspan="2">Used to find a side length on a right triangle.

Formula: $a^2+b^2=c^2$
</td></tr>
<tr><td colspan="2">Directions: Find the missing Side. Give your answer in simplest radical form.</td></tr>
<tr><td>1.

$a^2+b^2=c^2$
$\sqrt{4^2+8^2}=\sqrt{c^2}$
$c=\boxed{4\sqrt{5}}$</td><td>2.

$24^2=x^2+22^2$
$576=x^2+484$
$\sqrt{x^2}=\sqrt{576-484}$
$x=\boxed{2\sqrt{23}}$</td></tr>
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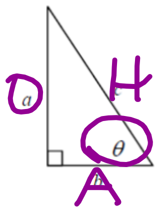
TRIGONOMETRIC FUNCTIONS



- A trigonometric function is a function whose rule is defined by a trigonometric ratio.
- A **trigonometric** ratio compares the lengths of two sides of the triangle.
- The Greek letter θ "theta" is used to represent the measure of an acute angle in a right triangle.

SINE sin	COSINE cos	TANGENT tan
$\frac{O}{H}$	A/H	O/A

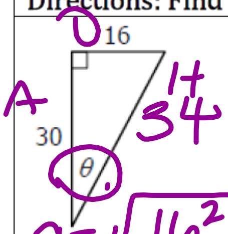
RECIPROCAL FUNCTIONS

$\frac{1}{\sin}$

COSECANT csc	SECANT sec	COTANGENT cot
H/O	$\frac{1}{\cos} = H/A$	$\frac{1}{\tan} = A/O$

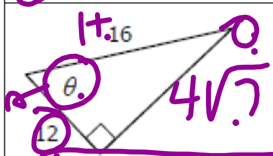
EXAMPLES

Directions: Find all six trig ratios for θ shown in the triangle below.



$c = \sqrt{16^2 + 30^2}$

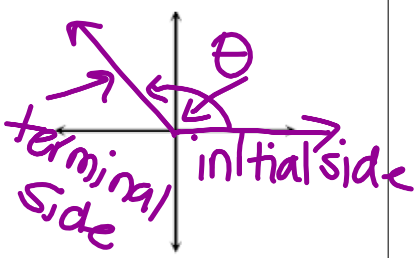
O/H: sin θ = $16/34 = \frac{8}{17}$	csc θ = $\frac{34}{16} = \frac{17}{8}$
A/H: cos θ = $30/34 = \frac{15}{17}$	sec θ = $\frac{34}{30} = \frac{17}{15}$
O/A: tan θ = $\frac{16}{30} = \frac{8}{15}$	cot θ = $\frac{30}{16} = 15/8$



$\sqrt{16^2 - 12^2} =$

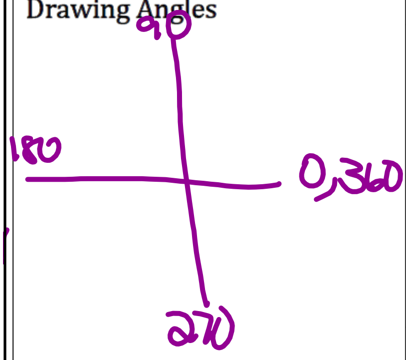
sin θ = $\frac{4\sqrt{7}}{16} = \frac{\sqrt{7}}{4}$	csc θ = $\frac{4}{\sqrt{7}} = \frac{4\sqrt{7}}{7}$
cos θ = $\frac{12}{16} = \frac{3}{4}$	sec θ = $4/3$
tan θ = $\frac{4\sqrt{7}}{12} = \frac{\sqrt{7}}{3}$	cot θ = $\frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$

Angles in Standard Position



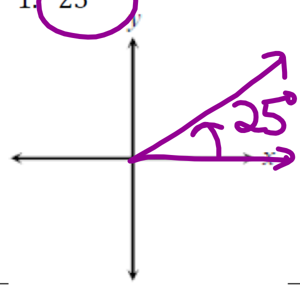
- An angle on the coordinate plane is in standard position when the vertex is on the origin and one ray lies on the positive x-axis.
- The ray on the x-axis is called the initial side
- The other ray is called the terminal side.
- Counterclockwise rotations result in positive angle measures.
- Clockwise rotations result in negative angle measures.
- One full revolution = 360.

Drawing Angles

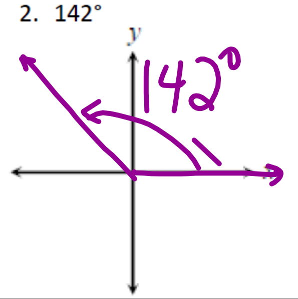


Directions: Sketch an angle with the given measure in standard position.

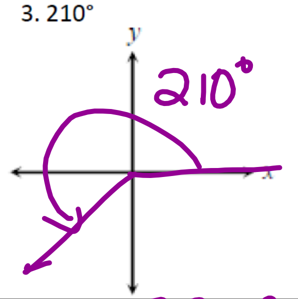
1. 25°



2. 142°

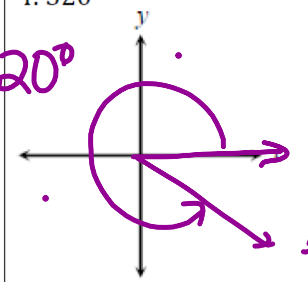


3. 210°

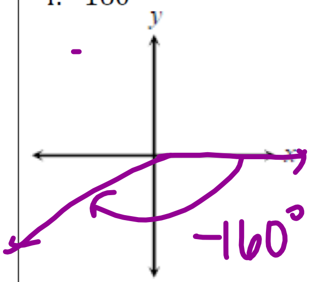


4. 320°

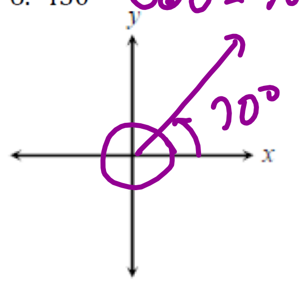
320°



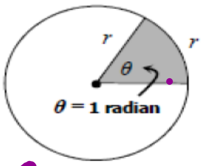
4. -160°

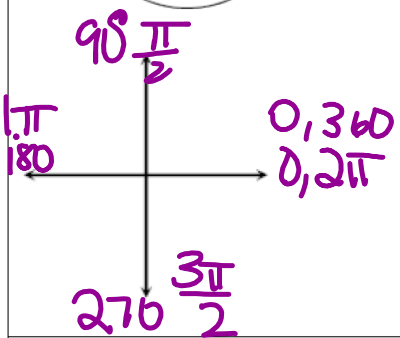


6. 430° -360 = 70



Radians Vs. Degrees





A radian is the measurement of an angle in standard position whose arc length, s, is equal to its radius, r. There are approximately 2π radians in every circle.

Recall that the circumference of a circle is $2\pi r$, therefore:

$$S = r\theta$$
$$2\pi \cancel{r} = \cancel{r}\theta$$
$$2\pi = \theta$$

We all know that every circle has 360 degrees so $360° = 2\pi$.

Converting Degrees → Radians	Converting Radians → Degrees
Multiply: $\frac{\pi}{180}$	Multiply: $\frac{180}{\pi}$

Degrees → Radians

Directions: Convert each measure to radians.

1. 30°	2. 150°	3. -220°
$\frac{30\pi}{180}$ $\frac{\pi}{6}$	$\frac{150\pi}{180} = \frac{5\pi}{6}$	$\frac{-220\pi}{180}$ $-\frac{11\pi}{9}$

Radians → Degrees

Directions: Convert each measure to degrees.

4. $\frac{4\pi}{3}$	5. $\frac{7\pi}{4}$	6. $\frac{-5\pi}{36}$
$\frac{4}{3}\cdot 180 =$ $240°$	$\frac{7}{4}\cdot 180$ $315°$	$\frac{-5}{36}\cdot 180$ $-25°$

$\frac{4\cancel{\pi}}{3}\cdot\frac{180}{\cancel{\pi}}$

Classwork: Do all on both sides.

When finished, write 2 sentences on what we did. Since we did two topics today, you will write 2 sentences.