

1 - standard position.docx

Tuesday, February 25, 2020 10:12 AM



1 - standard position




1 - standard position.do...

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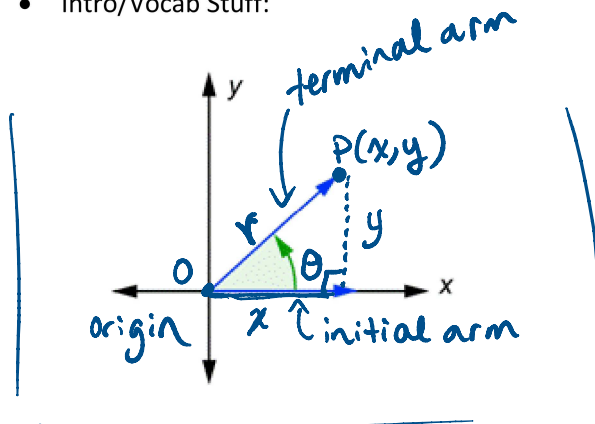
5.1 STANDARD POSITION IN Q1

Name: _____ Blk: _____

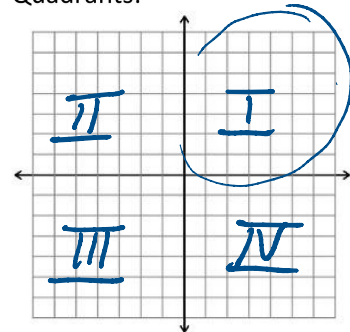
- Review what you know about TRIGONOMETRY

- pythagorean theorem $a^2 + b^2 = c^2$
- trig ratios sine, cosine, tangent
SOH CAH TOA
-  Right triangle 90°

- Intro/Vocab Stuff:



Quadrants:



- Use Pythagoras to determine r

$$x^2 + y^2 = r^2$$
$$r = \sqrt{x^2 + y^2}$$

- Use SOHCAHTOA to determine θ

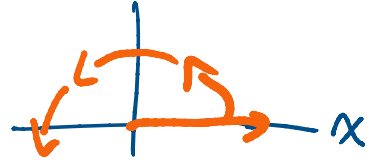
$$\theta = \sin^{-1}\left(\frac{y}{r}\right) \quad \text{or} \quad \theta = \cos^{-1}\left(\frac{x}{r}\right) \quad \text{or} \quad \theta = \tan^{-1}\left(\frac{y}{x}\right)$$

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$$\left. \begin{array}{l} \sin \theta = \frac{y}{r} \\ \cos \theta = \frac{x}{r} \end{array} \right\}$$

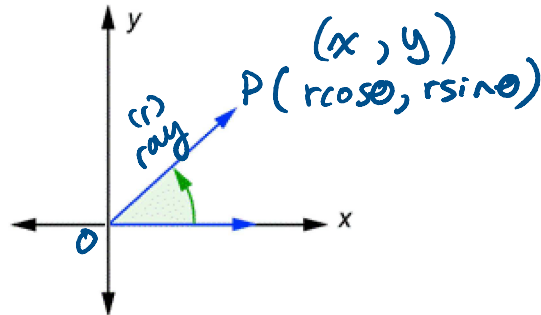
- Use θ and r to determine x and y

$$y = r \sin \theta \quad x = r \cos \theta$$

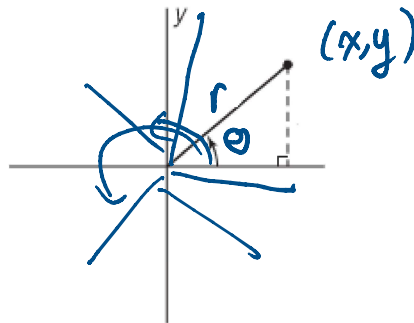


- When reading angles, always start at the positive x-axis and go counter clockwise
 - This is known as standard position

- The ray, OP , is the terminal arm of the angle and the point, P , is a terminal point.



- Trig Ratios:



$$\sin \theta = \frac{O}{H}$$

$$\cos \theta = \frac{A}{H}$$

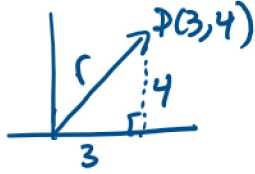
$$\tan \theta = \frac{O}{A}$$

- For any angle, θ , in standard position, where $0^\circ \leq \theta \leq 360^\circ$, with terminal point $P(x, y)$, the 'PRIMARY TRIGONOMETRIC RATIOS' are defined as:

$\cos \theta = \frac{x}{r}$	$\sin \theta = \frac{y}{r}$	$\tan \theta = \frac{y}{x}$
where $r =$ distance from the origin.		

YOU TRY SOME STUFF:

1. The point, $P(3,4)$ is on the terminal arm of an angle in standard position.
 a. Determine the distance r from the origin to point P .



$$r = \sqrt{3^2 + 4^2}$$

$$r = \sqrt{25}$$

$$r = 5$$

- b. Determine the primary trigonometric ratios of θ .

$$\sin \theta = \frac{4}{5} \quad \cos \theta = \frac{3}{5} \quad \tan \theta = \frac{4}{3}$$

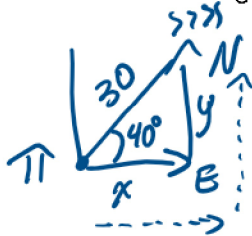
- c. Determine the measure of θ to the nearest degree.

*Use any ratio above!

$$\text{eg. } \tan \theta = \frac{4}{3}$$

$$\theta = \tan^{-1} \left(\frac{4}{3} \right) = 53.1 \hat{=} 53^\circ$$

2. A forest ranger sees smoke rising from a point that lies in a direction $E40^\circ N$. She estimates that the distance from the ranger station is about 30 km. The firefighters at the ranger station have to travel east then north to get to the fire. To the nearest kilometer, how far should the firefighters travel in each direction?



$$P(x, y) \quad \textcircled{1}$$

$$\downarrow$$

$$r \cos \theta, r \sin \theta$$

$$x = r \cos \theta$$

$$= 30 \cos 40^\circ$$

$$= 23 \text{ km East}$$

$$y = r \sin \theta$$

$$= 30 \sin 40^\circ$$

$$= 19 \text{ km N.}$$

(For home)

Assignment p. 409 - #3-12

#14, 16 (challenge Q's)

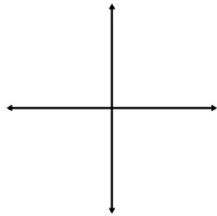
Assignment p. 409-#3-12 #14,16 (challenge Q's)

Right now ↓

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3. A point, P lies in quadrant 1 with an x coordinate of 8. If the angle of the terminal arm in standard position is 50° , determine the length of the terminal arm as well as the complete coordinates of point P.

4. Draw a terminal arm in standard position with an angle of 315° .



5. Find the coordinates for point $P(x, y)$ if $\theta = 70^\circ$ and $r = 16$. Round your answers to the nearest tenth.
6. What are the primary trigonometric ratios for θ if the coordinates for the terminal point are $(5, 8)$?

