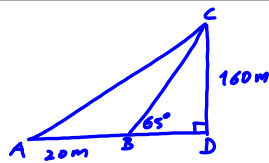
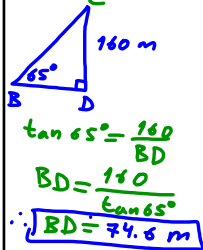


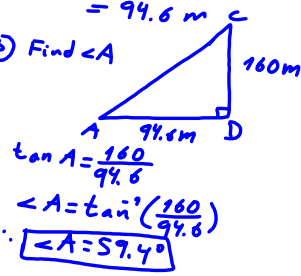
Hwk: Pg. 9: #8

① Find BD



② $AD = AB + BD$
 $= 20 + 74.6$
 $= 94.6 \text{ m}$

③ Find $\angle A$



Feb 8-10:05 AM

Investigating Primary Trigonometric Ratios of Obtuse Angles

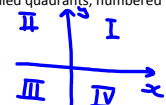
What is an acute angle?

An angle less than 90° .

What is an obtuse angle?

An angle greater than 90° and less than 180° .

The intersection of the x-axis and y-axis creates four regions, called quadrants, numbered counterclockwise starting from the upper right.



The angle made by line segment r with the positive x-axis is labelled angle A.

Another way of writing angles

Another way of writing the primary trig ratios when given a point $P(x, y)$ is SyrCxRTyx "Sir Kix R Ticks", where r is the length of the line segment from the origin to the point.

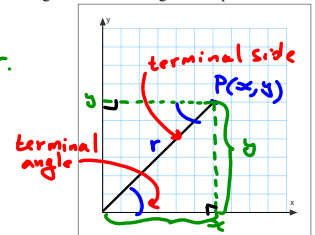
Use Pythagorean Theorem to find r.

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

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

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

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



Let's write the trig. ratios for angle P.

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

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

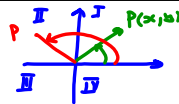
$\tan P = \frac{y}{x}$

Sep 1-2:23 PM

<http://www.mathopenref.com/trigterminalside.html>

Which type of angle is angle A if point P is in Quadrant I?

\therefore Angle A is an acute angle. (less than 90°)



Which type of angle is angle A if point P is in Quadrant II?

\therefore Angle is an obtuse angle (greater than 90°)

Example 1: If $P(5, 9)$, identify r, sin P, cos P, and tan P.

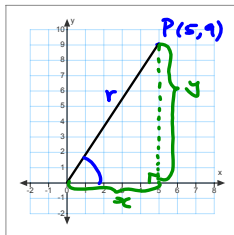
Solution:

$r = \sqrt{x^2 + y^2}$
 $= \sqrt{5^2 + 9^2}$
 $= \sqrt{25 + 81}$
 $= \sqrt{106}$

$\therefore \sin P = \frac{y}{r}$
 $= \frac{9}{\sqrt{106}}$

$\therefore \cos P = \frac{x}{r}$
 $= \frac{5}{\sqrt{106}}$

$\therefore \tan P = \frac{y}{x}$
 $= \frac{9}{5}$



Example 2: If $Q(-8, 3)$, identify r, sin Q, cos Q, and tan Q.

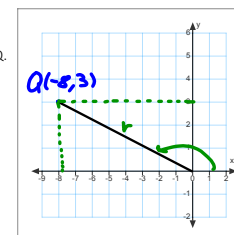
Solution:

$r = \sqrt{x^2 + y^2}$
 $= \sqrt{(-8)^2 + 3^2}$
 $= \sqrt{64 + 9}$
 $= \sqrt{73}$

$\therefore \sin Q = \frac{y}{r}$
 $= \frac{3}{\sqrt{73}}$

$\therefore \cos Q = \frac{x}{r}$
 $= \frac{-8}{\sqrt{73}}$

$\therefore \tan Q = \frac{y}{x}$
 $= \frac{3}{-8}$



Sep 1-2:28 PM

CAST Rule:

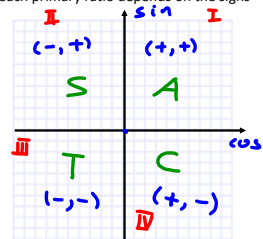
The CAST rule is an easy way to remember which primary trigonometric ratios are positive in which quadrant. Since r is always positive, the sign of each primary ratio depends on the signs of the coordinates of the point.

Quadrant I: All the trig. ratios are positive

Quadrant II: Only the sine ratio is positive

Quadrant III: Only the tangent ratio is positive

Quadrant IV: Only the cosine ratio is positive

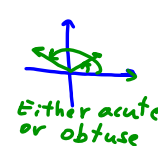


Example 3: Is angle A acute, obtuse, or either? Justify your answers.

a) $\cos A = 0.45$

b) $\sin A = 0.91$

c) $\tan A = -0.70$



Homework: Pg. 19: #1-6

Sep 1-2:30 PM