WARM UP

5/7/14

Target 9B & 9C

Sketch each angle. Then find the reference angle, theta prime.

$30 \cdot \frac{\pi}{180} = \frac{30\pi}{180} = \boxed{\frac{\pi}{6}}$

1) $260°$

$\theta' = \theta - 180$

$= 260 - 180 = \boxed{80°}$

2) $\frac{11\pi}{6} \cdot \frac{180}{\pi} = 330°$

$\theta' = 360 - \theta$

$= 360 - 330$

$= 30°$

13.3. Advanced Algebra

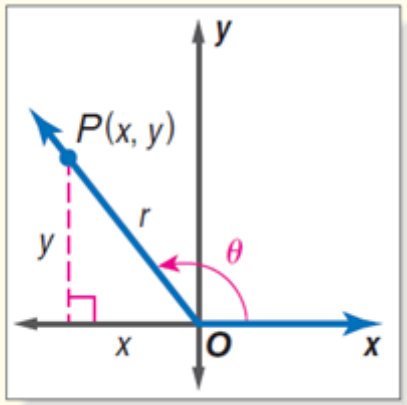
DATE: 5/7

Trig Functions of General Angles (Part 2)

Target 9.D. Determine the exact values of the six trigonometric functions given the terminal side of Θ passing through a given point P(x,y) or using reference triangles.

Trigonometric Functions, θ in Standard Position

Let θ be an angle in standard position and let $P(x, y)$ be a point on the terminal side of θ. Using the Pythagorean Theorem, the distance r from the origin to P is given by $r = \sqrt{x^2 + y^2}$. The trigonometric functions of an angle in standard position may be defined as follows:



$\sin\theta = \frac{y}{r} = \frac{opp}{hyp}$ $\quad \cos\theta = \frac{x}{r} = \frac{adj}{hyp}$ $\quad \tan\theta = \frac{y}{x}, x \neq 0$ // $\frac{opp}{adj}$

$\csc\theta = \frac{r}{y}, y \neq 0$ $\quad \sec\theta = \frac{r}{x}, x \neq 0$ $\quad \cot\theta = \frac{x}{y}, y \neq 0$

// $\frac{hyp}{opp}$ // $\frac{hyp}{adj}$ // $\frac{adj}{opp}$

Evaluate Trigonometric Functions for a Given Point

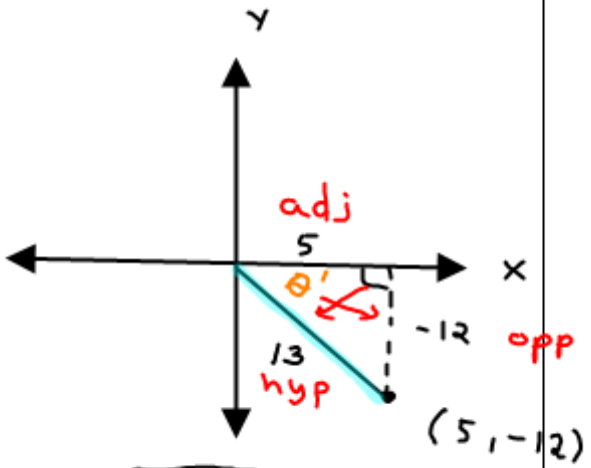
Evaluate Trigonometric Functions for a Given Point

Find the exact values of the six trigonometric functions of θ if the terminal side of θ contains the given point.

x y

1. $(5, -12)$

1. $\sin\theta = \frac{o}{h} = \frac{-12}{13}$
2. $\cos\theta = \frac{a}{h} = \frac{5}{13}$
3. $\tan\theta = \frac{o}{a} = \frac{-12}{5}$
4. $\csc\theta = \frac{13}{-12}$
5. $\sec\theta = \frac{13}{5}$
6. $\cot\theta = \frac{5}{-12}$



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

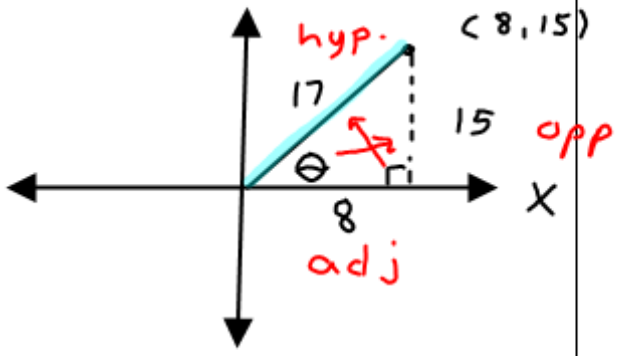
$= \sqrt{(5)^2 + (-12)^2}$

$= 13$

Find the exact values of the six trigonometric functions of θ if the terminal side of θ contains the given point.

2. $(\overset{x}{8}, \overset{y}{15})$

1. $\sin\theta = \frac{15}{17}$
2. $\cos\theta = \frac{8}{17}$
3. $\tan\theta = \frac{15}{8}$
4. $\csc\theta = \frac{17}{15}$
5. $\sec\theta = \frac{17}{8}$
6. $\cot\theta = \frac{8}{15}$



$r = \sqrt{8^2+15^2} = 17$

Find the exact values of the six trigonometric functions of θ if the terminal side of θ contains the given point.

Find the exact values of the six trigonometric functions of θ if the terminal side of θ contains the given point.

x y

3. $(-3, -4)$

1. $\sin\theta = \frac{-4}{5}$

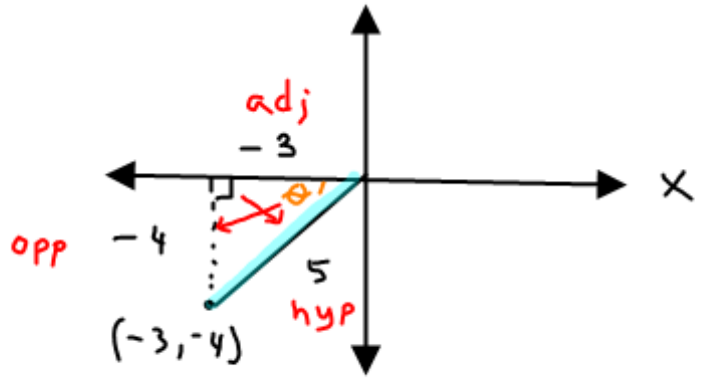
2. $\cos\theta = \frac{-3}{5}$

3. $\tan\theta = \frac{-4}{-3} = \frac{4}{3}$

4. $\csc\theta = \frac{5}{-4}$

5. $\sec\theta = \frac{5}{-3}$

6. $\cot\theta = \frac{3}{4}$



$r = \sqrt{(-3)^2 + (-4)^2} = 5$