U2D6_T Trig Ratios of Obtuse Triangles

Monday, February 26, 2018 12:47 PM

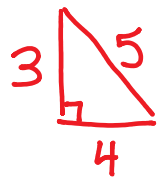
U2D6_T
Trig Ratio...

MAP 4CI Trigonometric Ratios for Obtuse Angles in Standard Position

Unit 2 Day 6

1. The sine of an obtuse angle, θ, in standard position is $\frac{3}{5}$ $\frac{y}{r}$

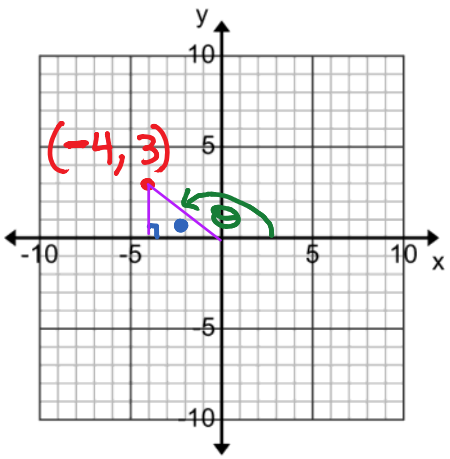
a) Identify the coordinates of a point that lies on the terminal arm of ∠θ.



$x^2 + y^2 = r^2$
$x^2 + 3^2 = 5^2$
$x^2 = 25 - 9$
$x^2 = 16$
$x = 4$

for obtuse angle, use $x = -4$

b) Sketch a diagram of ∠θ.



c) Determine cos θ and tan θ.

$\cos\theta = \frac{x}{r}$ $\tan\theta = \frac{y}{x}$

$= \frac{-4}{5}$ $= \frac{3}{-4}$

OR -0.8 OR -0.75

d) Determine the measure of $\angle\theta$, using a calculator.

$\sin^{-1}(3 \div 5)$

$= 36.86°$

$180° - 36.86°$

$= \boxed{143.14°}$

$\cos^{-1}(-0.8)$

$= \boxed{143.13°}$

$\tan^{-1}(-0.75)$

$= -36.86°$

$180° - 36.86°$

$= \boxed{143.14°}$

2. The tangent of an obtuse angle, θ, in standard position is -1. $\frac{1}{-1}$ $\frac{y}{x}$

a) Identify the coordinates of a point that lies on the terminal arm of ∠θ.

$x=-1,\ y=1$

$(-1, 1)$

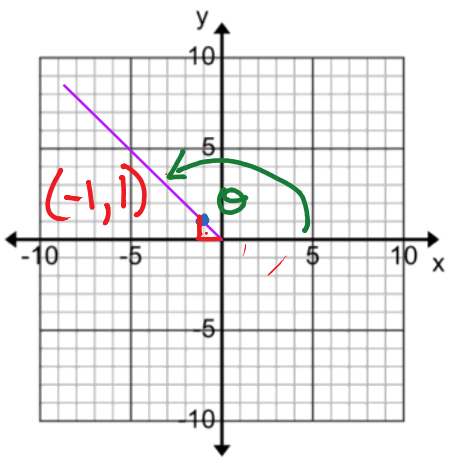
for later

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

$r = \sqrt{1+1}$

$r = \sqrt{2}$

b) Sketch a diagram of ∠θ.



c) Determine sin θ and cos θ. Round your answers to three decimal places.

$\sin\theta = \frac{y}{r}$ $\quad \cos\theta = \frac{x}{r}$

$= \frac{1}{\sqrt{2}}$ $\quad = \frac{-1}{\sqrt{2}}$

$\doteq 0.707$ $\quad = -0.707$

d) Determine the measure of $\angle\theta$, using a calculator.

$\cos^{-1}(-0.707)$

$= 135°$

$\sin^{-1}(0.707)$

$= 45°$

so $\theta = 180° - 45°$

$= 135°$

$\tan^{-1}(-1)$

$= -45°$

so, $\theta = -45° + 180°$

$\theta = 135°$

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