Spiral Review

The point is on the terminal side of an angle in standard form. Determine the exact values of the six trigonometric functions of the angle.

(4, -5)

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

$r = \sqrt{41}$

$\sin\theta = \frac{-5}{\sqrt{41}} \cdot \frac{\sqrt{41}}{\sqrt{41}} = -\frac{5\sqrt{41}}{41}$

$\csc\theta = \frac{\sqrt{41}}{-5}$

$\cos\theta = \frac{4\sqrt{41}}{41}$

$\sec\theta = \frac{\sqrt{41}}{4}$

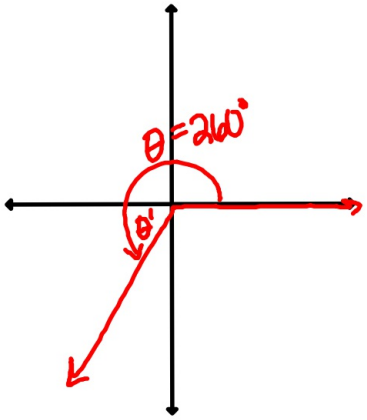
$\tan\theta = -\frac{5}{4}$

$\cot\theta = -\frac{4}{5}$

p. 284 4.4 Trigonometric Functions of Any Angle

Reference Angles (θ'):

The angle formed from the terminal side and the x-axis.



Find the reference angle:

a.) $\theta = 313^\circ$ $360 - 313 = \boxed{47^\circ}$

b.) $\theta = -210^\circ$ $+360$ 150° $180 - 150 = \boxed{30^\circ}$

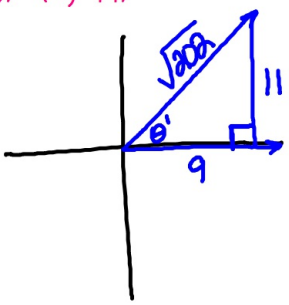
c.) $\theta = 105^\circ$ $180 - 105 = \boxed{75^\circ}$

d) $\theta = 260^\circ$ $260 - 180 = \boxed{80^\circ}$

Students will be able to find the angle and the exact values of sine, cosine, and tangent.

Example 1: Sketch the triangle. Find θ, $\sin\theta$, $\cos\theta$, $\tan\theta$ as exact values.

a.) (9, 11)



① Find third side.

$r = \sqrt{9^2+11^2}$

$r = \sqrt{202}$

② $\sin\theta = \frac{11}{\sqrt{202}} \cdot \frac{\sqrt{202}}{\sqrt{202}} = \frac{11\sqrt{202}}{202}$

Use SA CA TA

$\cos\theta = \frac{9}{\sqrt{202}} \cdot \frac{\sqrt{202}}{\sqrt{202}} = \frac{9\sqrt{202}}{202}$

$\tan\theta = \frac{11}{9}$

③ Find θ'

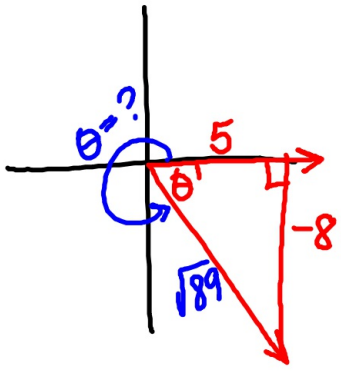
use inverse: 2nd tan (11÷9)

$\theta' = 51°$

$\theta' = \theta = 51°$

Students will be able to find the angle and the exact values of sine, cosine, and tangent.

b.) (5, -8)



① $r = \sqrt{5^2+(-8)^2}$

$r = \sqrt{89}$

② $\sin\theta' = \frac{-8\sqrt{89}}{89}$

$\cos\theta' = \frac{5\sqrt{89}}{89}$

$\tan\theta' = \frac{-8}{5}$

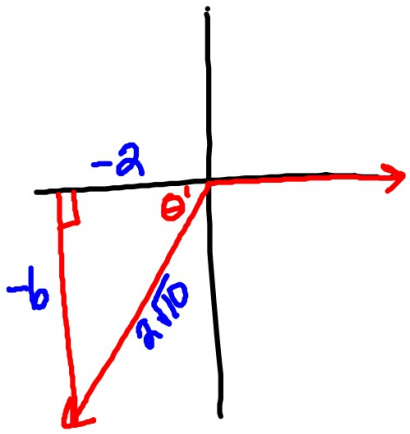
③ $\theta' =$ 2nd tan (-8÷5)

$\theta' = 58°$

$\theta = 360 - 58 = 302°$

Students will be able to find the angle and the exact values of sine, cosine, and tangent.

c.) (-2, -6)



① $r = \sqrt{(-2)^2 + (-6)^2}$

$r = 2\sqrt{10}$

② $\sin\theta = \frac{-6^3}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = -\frac{3\sqrt{10}}{10}$

$\cos\theta' = \frac{-2^1}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = -\frac{\sqrt{10}}{10}$

$\tan\theta' = \frac{-6}{-2} = 3$

③ $\theta' = 72°$

$\theta = 180 + 72$

$\theta = 252°$

Students will be able to find the angle and the exact values of all the trigonometric functions.

Example 2: Find θ. Find the exact value of all the trigonometric functions.

a.) (-5, 8)

HW:

p. 289 (15-22)

*15-18 sin, cos, tan

**19-22 all trig functions