ST. JEAN DE BREBEUF

MATHEMATICS

CHAPTER 2.2

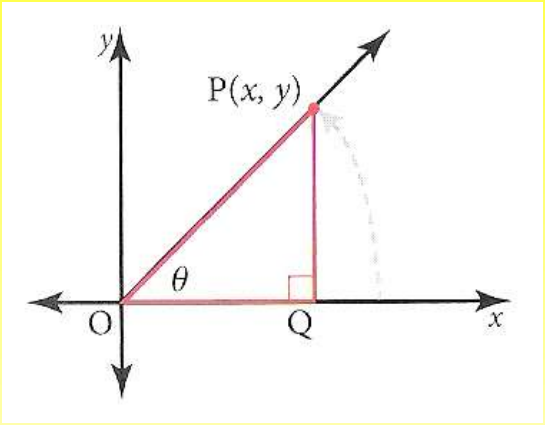
TRIGONOMETRIC RATIOS

WITH OBTUSE ANGLES

CHAPTER 2.2 TRIGONOMETRIC RATIOS WITH OBTUSE ANGLES

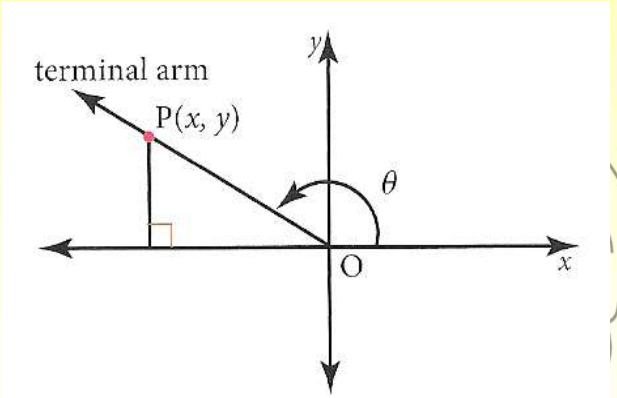
KEY CONCEPTS

An angle measured in **standard position** is measured <u>counter-clockwise</u> about the origin from the positive *x*-axis on the Cartesian plane



Acute Angle in Standard Position

The *primary trigonometric ratios* of an angle, ɵ, in standard position are defined in terms of the coordinates of a point, *P(x, y)*, on the terminal arm, as follows



Obtuse Angle in Standard Position

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KEY CONCEPTS

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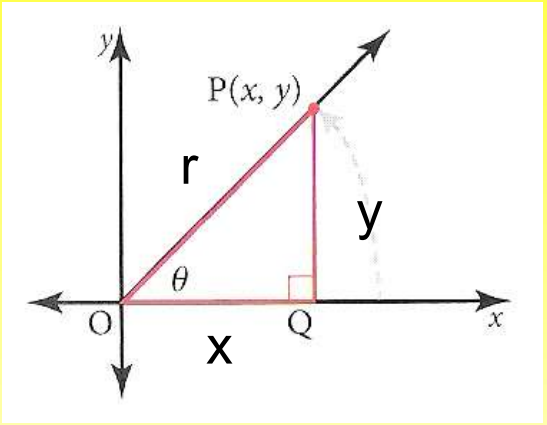
$$\sin\theta = \frac{opposite}{hypotenuse} = \frac{y}{r}$$

$$\cos\theta = \frac{adjacent}{hypotenuse} = \frac{x}{r}$$

$$\tan\theta = \frac{opposite}{adjacent} = \frac{y}{x}$$

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



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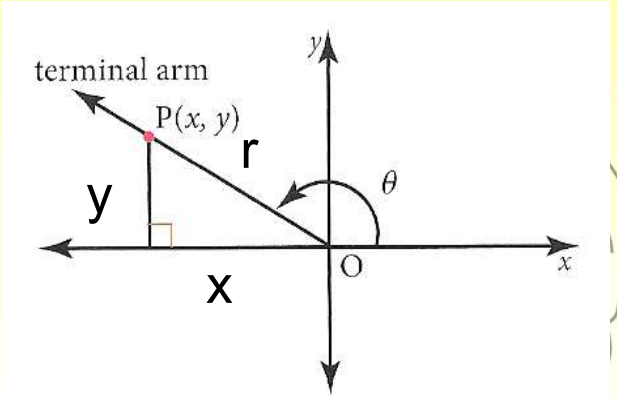

Obtuse Angle in Standard Position

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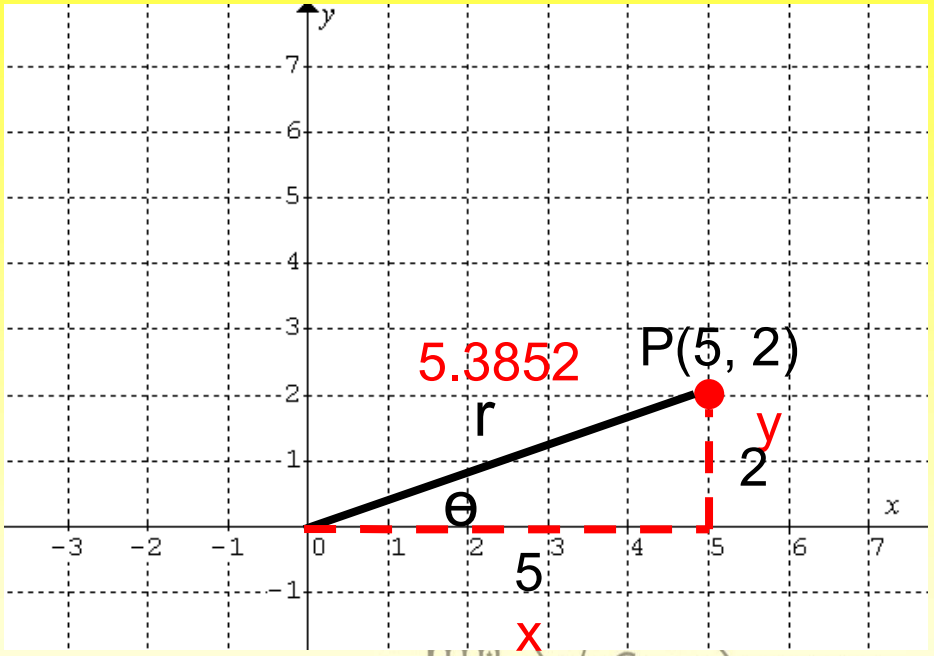
CHAPTER 2.2 TRIGONOMETRIC RATIOS WITH OBTUSE ANGLES

EXAMPLE 1

Acute Angles in Standard Position

Determine the primary trigonometric ratios of the angle in standard position with terminal arm passing through **P(5, 2)**. Round your answers to four decimal places.



Need to solve for "r"

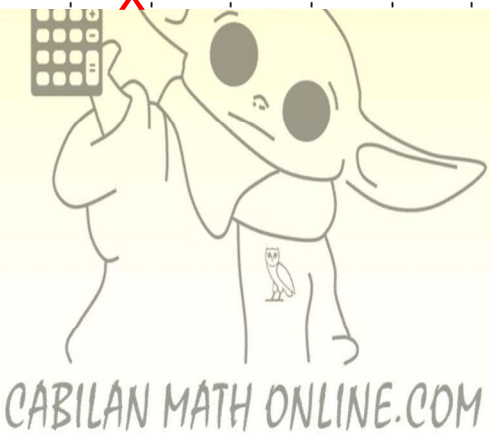
$$r = \sqrt{x^2 + y^2}$$

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

$$r = \sqrt{25 + 4}$$

$$r = \sqrt{29}$$

$$\boxed{r = 5.3852}$$



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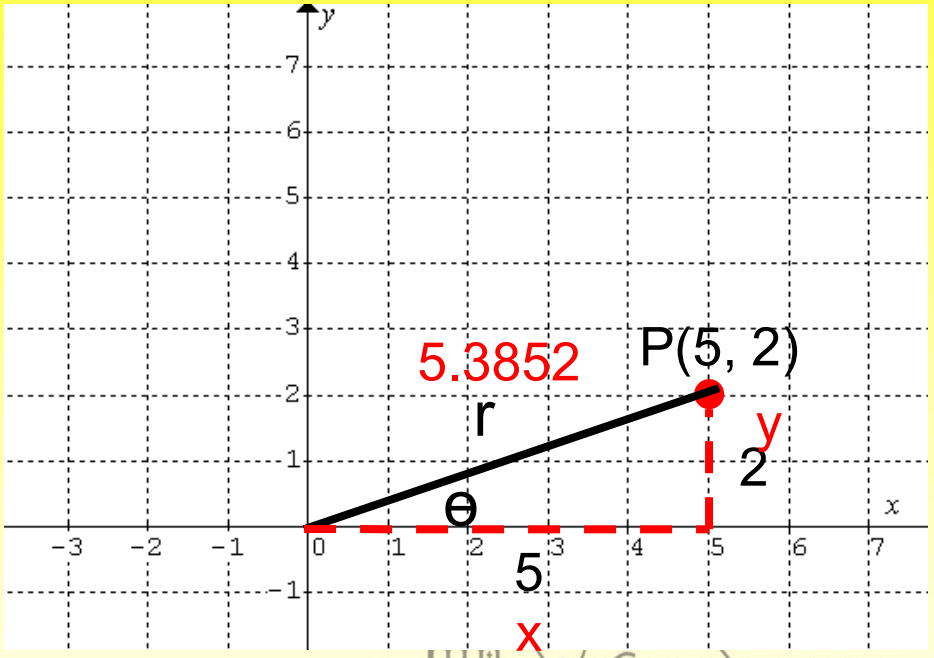

$$\sin\theta = \frac{y}{r} \qquad \cos\theta = \frac{x}{r} \qquad \tan\theta = \frac{y}{x}$$

$$\sin\theta = \frac{2}{5.3852} \qquad \cos\theta = \frac{5}{5.3852} \qquad \tan\theta = \frac{2}{5}$$

$$\sin\theta = 0.3714 \qquad \cos\theta = 0.9285 \qquad \tan\theta = 0.4$$

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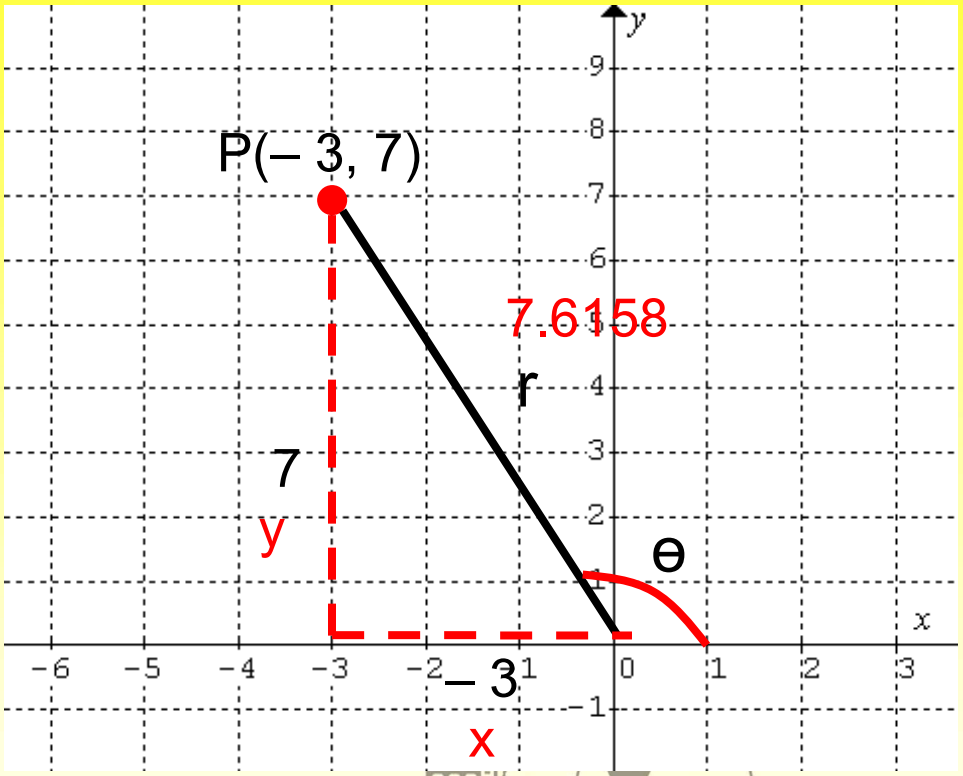
CHAPTER 2.2 TRIGONOMETRIC RATIOS WITH OBTUSE ANGLES

EXAMPLE 2

Obtuse Angles in Standard Position

The point **P(– 3, 7)** lies on the terminal arm of an angle, ɵ, in standard position. Determine the primary trigonometric ratios of ɵ to four decimal places.



Need to solve for "r"

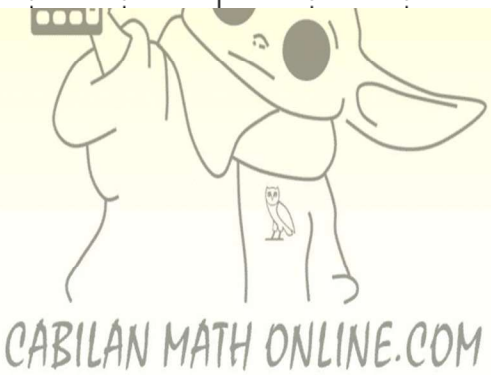
$$r = \sqrt{x^2 + y^2}$$

$$r = \sqrt{(-3)^2 + (7)^2}$$

$$r = \sqrt{9 + 49}$$

$$r = \sqrt{58}$$

$$\boxed{r = 7.6158}$$



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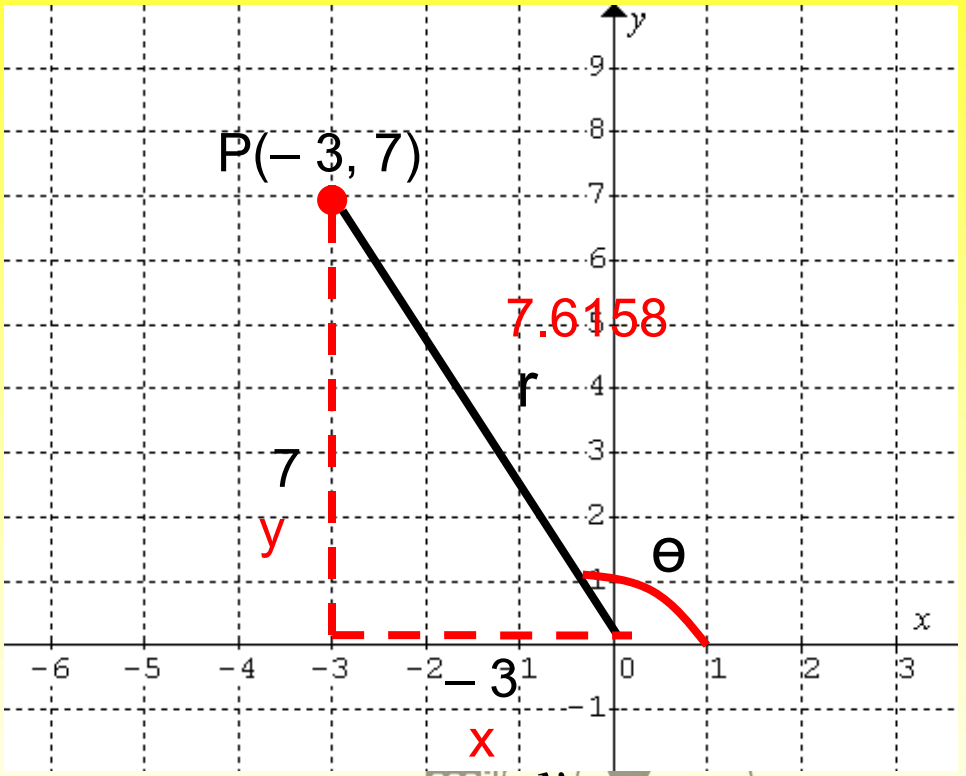

$$\sin\theta = \frac{y}{r} \qquad \cos\theta = \frac{x}{r} \qquad \tan\theta = \frac{y}{x}$$

$$\sin\theta = \frac{7}{7.6158} \qquad \cos\theta = \frac{-3}{7.6158} \qquad \tan\theta = \frac{7}{-3}$$

$$\sin\theta = 0.9191 \qquad \cos\theta = -0.3939 \qquad \tan\theta = -2.3333$$

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SEATWORK / HOMEWORK

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