

3.3 Evaluation of Sinusoidal Functions

Name: _____

#1-4 For each of the following functions use **algebraic** methods to:

a.) Find $f(x)$ for the given value of x

↑ except part a 😊

b.) Find the general solutions and the first three positive values of x for the given value of $f(x)$

Round to three decimal places.

1. $f(x) = 2 + 5 \cos \frac{\pi}{10}(x-3)$

a.) Find $f(8.3)$

$$= 2 + 5 \cos \frac{\pi}{10}(8.3-3) = 1.529$$

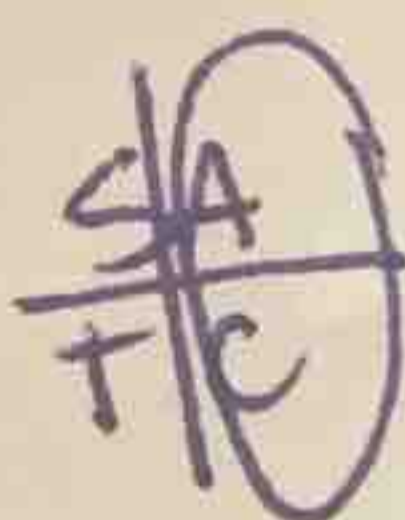
b.) $f(x) = 5$

$$5 = 2 + 5 \cos \frac{\pi}{10}(x-3)$$

$$3 = 5 \cos \frac{\pi}{10}(x-3)$$

$$\frac{3}{5} = \cos \frac{\pi}{10}(x-3)$$

$$\cos^{-1}\left(\frac{3}{5}\right) = \frac{\pi}{10}(x-3)$$



$$\text{QI. } 0.927 + 2\pi n = \frac{\pi}{10}(x-3)$$

$$2.952 + 20n = x - 3$$

$$5.952 + 20n = x$$

$$\text{QIV. } -0.927 + 2\pi n = \frac{\pi}{10}(x-3)$$

$$-2.952 + 20n = x - 3$$

$$0.048 + 20n = x$$

$$\boxed{0.048, 5.952, 20.048}$$

2. $y = 4 + 3 \sin \frac{\pi}{6}(x-2)$

a.) Find $f(12.7)$ 2.112

b.) $f(x) = 6$

$$x = 3.394 + 12n$$

$$x = 6.607 + 12n$$

$$3.394, 6.607, 19.394$$

3. $y = -2 + 4 \sin \frac{\pi}{2}(x-0.3)$

a.) Find $f(2.8)$ -4.828

b.) $f(x) = 0$

$$\text{QI. } 0.634 + 4n = x$$

QII. π -ans

$$2.618 + 2\pi n = \frac{\pi}{2}(x-0.3)$$

$$1.967 + 4n = x$$

$$0.634, 1.967, 4.634$$

4. $y = -1 + 3 \cos \frac{\pi}{3}(x + 5.2)$

a.) Find $f(5)$ -1.927

b.) $f(x) = 1$

$-4.397 + 6\pi = x$

$-6.003 + 6\pi = x$

$1.603, 5.997, 7.603$

#5-8 For each of the following functions use your graphing calculator to:

c.) Find $f(x)$ for the given value of x

d.) Find the first three positive values of x for the given value of $f(x)$

Round to three decimal places.

5. $y = 3 + 5 \sin \frac{\pi}{9}(x - 11)$

a.) Find $f(7)$

-1.924

b.) $f(x) = 2$

$y_1 = 3 + 5 \sin \frac{\pi}{9}(x - 11)$

$y_2 = 2$

WINDOW

$x_{\min} = 0$

$y_{\min} = -2$

$x_{\max} = 27$

$y_{\max} = 8$

$2.577,$
 $10.423,$
 20.577

7. $y = 5 + 4 \sin \frac{\pi}{12}(x + 10)$

a.) Find $f(1)$

6.035

b.) $f(x) = 2.5$

$4.579, 11.421, 28.579$

6. $y = 1 + 6 \cos \frac{\pi}{13}(x - 20)$

a.) Find $f(4.3)$

-3.767

b.) $f(x) = -4.5$

$5.299, 8.701, 31.299$

Functioning,
 $f(x)$ value in y_2
Set window
2nd TRACE
5: intersect
scroll to intersection,
enter 3 times

8. $y = 1 + 3 \cos \frac{\pi}{8}(x + 7)$

a.) Find $f(13)$

1

b.) $f(x) = -1$

$3.142, 14.858, 19.142$