

# 4.1 Evaluating Sinusoids

**Essential Question:** How do I evaluate sinusoidal functions algebraically and using a calculator?

Reminders...

$$\sin x = 8$$

~~inverse~~( $\sin x$ ) =  $\sin^{-1}(8)$

$\underline{x}$

# 4.1 Evaluating Sinusoids

Essential Question: How do I evaluate sinusoidal functions using a calculator?

$$1. f(x) = 2 + 3 \cos \frac{\pi}{9}(x - 6)$$

$$f(x) = 4$$

$$A. f(8) = 2 + 3 \cos \left( \frac{\pi}{9} (8-6) \right)$$

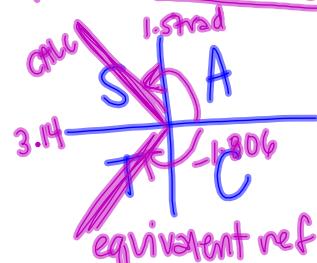
A. 2.98

$$B. f(x) = 1.3$$

$$\begin{array}{r} 1.3 = 2 + 3 \cos \frac{\pi}{9}(x-6) \\ -2 \quad -2 \\ \hline -0.7 = 3 \cos \frac{\pi}{9}(x-6) \\ \hline 3 \end{array}$$

$$\frac{-0.7}{3} = \cos \frac{\pi}{9}(x-6)$$

$$1.806 \quad \boxed{\cos^{-1} \left( -\frac{0.7}{3} \right) = \frac{\pi}{9}(x-6)}$$



1st 3 positive values  
• 8.26, 11.174, 18.826

$$\textcircled{1} \text{ QII} \quad 11.806 + 2\pi n = \frac{\pi}{9}(x-6) \quad \text{π}$$

$$5.174 + 18n = x - 6$$

$$+6 \quad +6$$

$$11.174 + 18n = x$$

general soln

$$\textcircled{2} \text{ QIII} \quad \frac{\pi}{9}(-1.806 + 2\pi n) = \frac{\pi}{9}(x-6) \quad \text{π}$$

$$-5.174 + 18n = x - 6$$

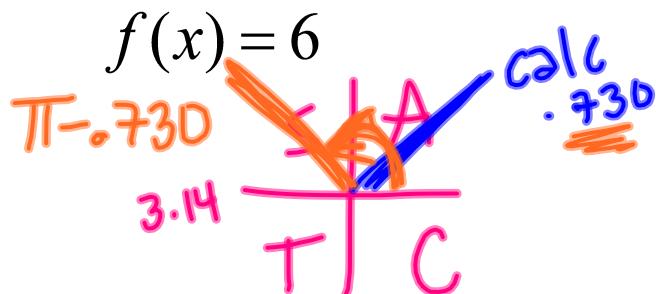
$$+6 \quad +6$$

$$8.26 + 18n = x$$

# 4.1 Evaluating Sinusoids

Essential Question: How do I evaluate sinusoidal functions using a calculator?

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



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

$$\frac{2}{3} = 3 \sin \frac{\pi}{6}(x - 2)$$

$$\frac{2}{3} = \sin \frac{\pi}{6}(x - 2)$$

$$\sin^{-1}\left(\frac{2}{3}\right) = \frac{\pi}{6}(x - 2)$$

$$\frac{6}{\pi} \left(730 + 2\pi n\right) = \left(\frac{\pi}{6}(x - 2)\right) \frac{6}{\pi}$$

$$1.394 + 12n = x - 2$$

+2

$$\boxed{3.394 + 12n = x}$$

$$\text{QII } \frac{6}{\pi} (2.412 + 2\pi n) = \left(\frac{\pi}{6}(x - 2)\right) \frac{6}{\pi}$$

$$4.607 + 12n = x - 2$$

+2

$$\boxed{6.607 + 12n = x}$$

general solution