

KEY

$$\text{frequency} = \frac{B}{2\pi}$$

Identify period, amplitude, and shift of sine and cosine functions

Name: _____

from an equation

Date: _____ Period: _____

Worksheet

$$y = A \sin(Bx + C) + D$$

amplitude = $|A|$ period = $\frac{2\pi}{B}$ phase shift = $-C$ vertical shift = D

1. Find the period of the function defined below.

$$y = \sin\left(\frac{5\pi}{4}x\right)$$

$$2\pi \div \frac{5\pi}{4} = 2\pi \times \frac{4}{5\pi}$$

$$\frac{8}{5} = P$$

2. Find the period of the function defined below.

$$y = \cos\left(\frac{3\pi}{2}x\right)$$

$$2\pi \div \frac{3\pi}{2} = 2\pi \times \frac{2}{3\pi}$$

$$\frac{4}{3} = P$$

3. Find the amplitude of the function defined below.

$$y = -8 \cdot \sin\left(\frac{\pi}{3}x\right)$$



$$8 = A$$

4. Find the amplitude of the function defined below.

$$y = 4 \cdot \cos\left(\frac{7\pi}{6}x\right)$$

$$4 = A$$

5. Find the phase shift and vertical shift of the function defined below.

$$y = -10 \cdot \sin\left(x + \frac{\pi}{6}\right) - \frac{11}{8}$$

$$\frac{-\pi}{6} \quad -\frac{11}{8}$$

(or $\frac{\pi}{6}$ left) ($\frac{11}{8}$ down)

6. Find the phase shift and vertical shift of the function defined below.

$$y = 11 \cdot \cos\left(x + \frac{\pi}{4}\right) + \frac{1}{2}$$

$$\frac{-\pi}{4} \quad +\frac{1}{2}$$

($\frac{\pi}{4}$ left) ($\frac{1}{2}$ up)

7. Find the phase shift and vertical shift of the function defined below.

$$y = 2 \cdot \sin\left(x + \frac{5\pi}{3}\right) - \frac{4}{9}$$

$$\frac{-5\pi}{3} \quad -\frac{4}{9}$$

($\frac{5\pi}{3}$ left) ($\frac{4}{9}$ down)

8. Find the phase shift and vertical shift of the function defined below.

$$y = \frac{5}{2} \cdot \cos(4(x - 4)) - 9$$

$$+4 \quad -9$$

(4 right) (9 down)

9. Find the frequency of the function defined below.

$$y = \sin\left(\frac{11\pi}{6}x\right)$$

$$\frac{11\pi}{6} \times \frac{1}{2\pi} = \frac{11}{12} = f$$

10. Find the frequency of the function defined below.

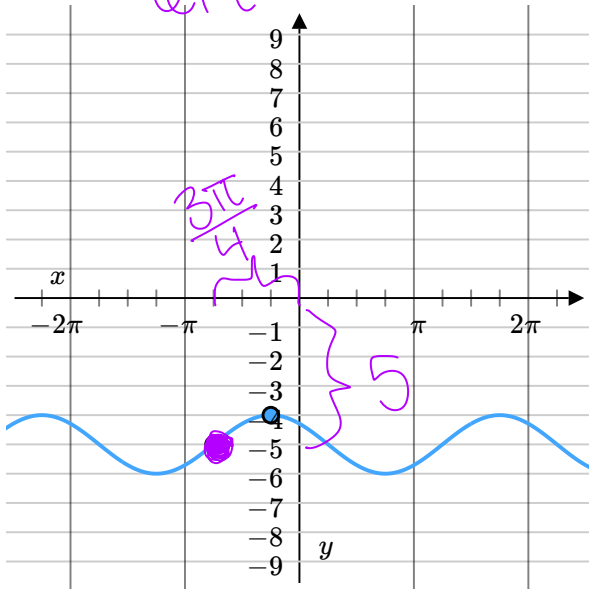
$$y = \cos\left(\frac{5\pi}{4}x\right)$$

$$\frac{5\pi}{4} \times \frac{1}{2\pi} = \frac{5}{8} = f$$

1. Graph the sine function below.

$$y = \sin\left(x + \frac{3\pi}{4}\right) - 5$$

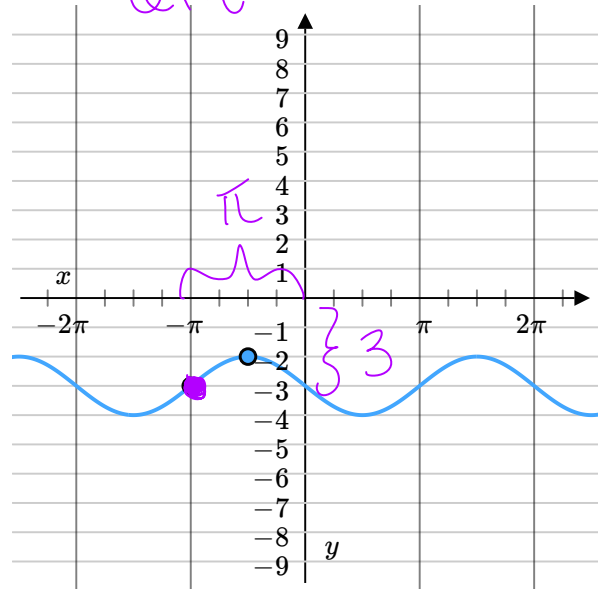
left down



2. Graph the sine function below.

$$y = \sin(x + \pi) - 3$$

left down

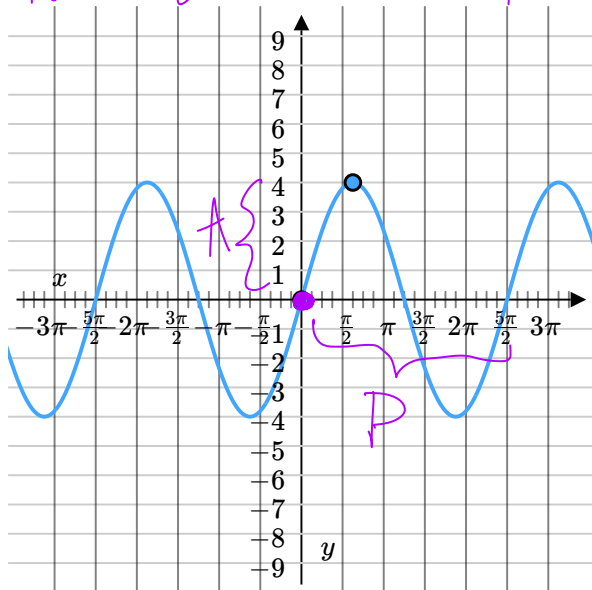


3. Graph the sine function below.

$$y = 4 \cdot \sin\left(\frac{4}{5}x\right)$$

$$R[-4, 4]$$

$$2\pi \times \frac{5}{4} = \frac{10\pi}{4} = \frac{5\pi}{2} = P$$

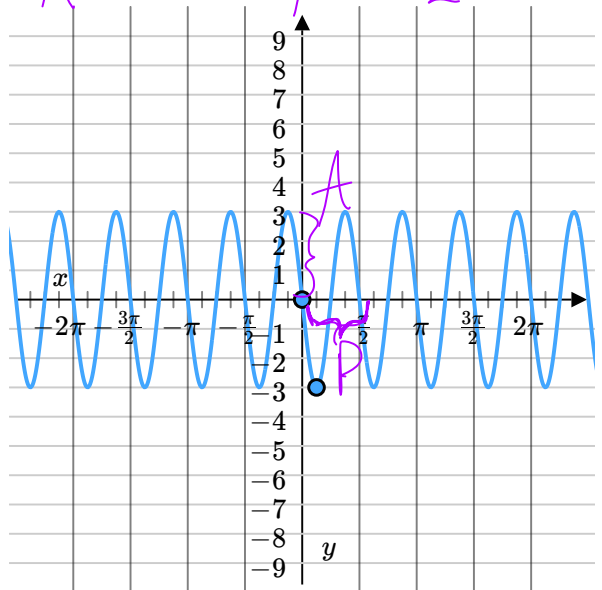


4. Graph the sine function below.

$$y = 3 \cdot \sin(-4x)$$

$$R[-3, 3]$$

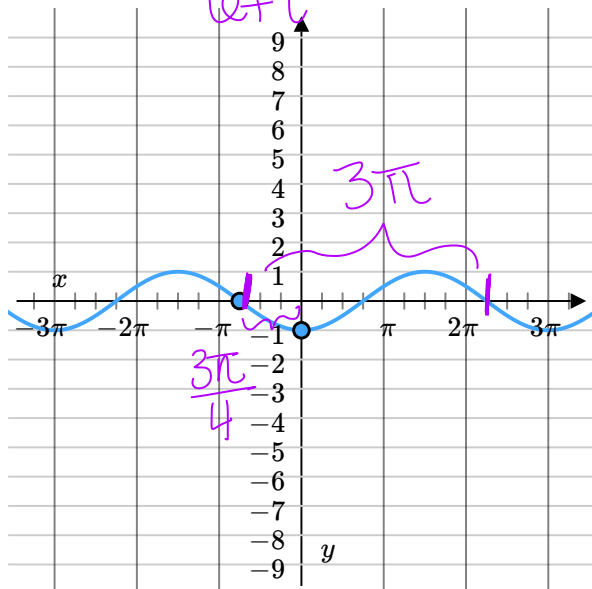
$$\frac{2\pi}{-4} = -\frac{\pi}{2} = P$$



5. Graph the sine function below.

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

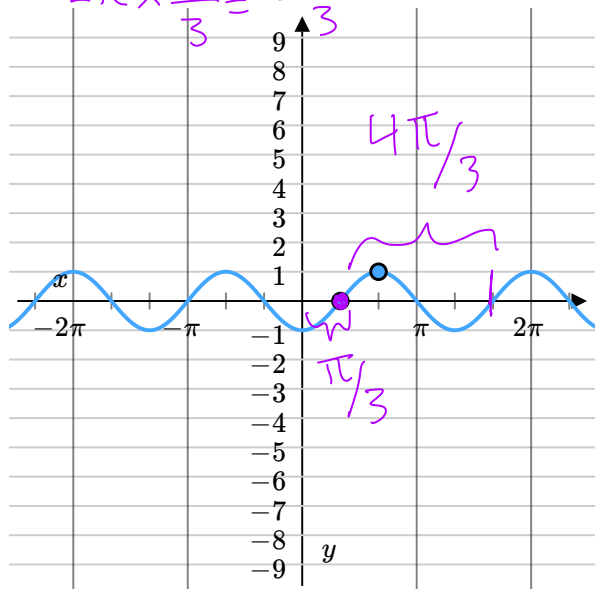
$$2\pi \times \frac{3}{2} = -3\pi$$



6. Graph the sine function below.

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

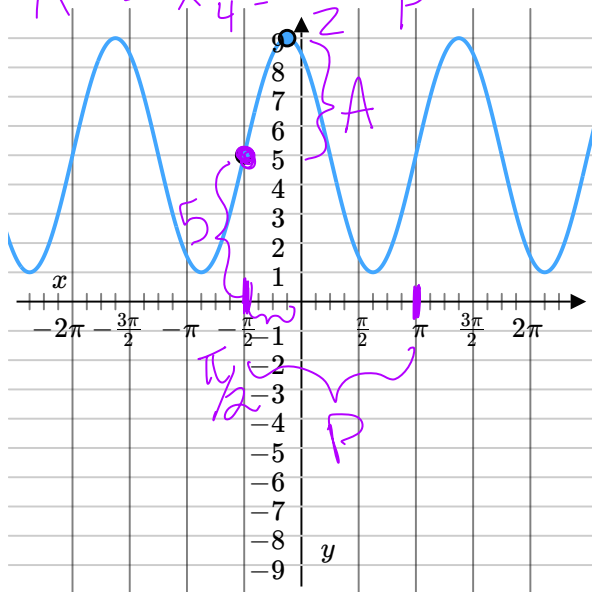
$$2\pi \times \frac{2}{3} = \frac{4\pi}{3}$$



7. Graph the sine function below.

$$y = 4 \cdot \sin\left(\frac{4}{3}\left(x + \frac{\pi}{2}\right)\right) + 5$$

Handwritten notes:
 A: Amplitude = 4
 $2\pi \times \frac{3}{4} = \frac{3\pi}{2} = P$ (Period)
 $\frac{\pi}{2}$ (Phase Shift)
 5 (Vertical Shift)
 up (Direction)



8. Graph the sine function below.

$$y = -4 \cdot \sin\left(\frac{4}{3}\left(x + \frac{\pi}{4}\right)\right) + 1$$

Handwritten notes:
 A: Amplitude = 4
 $2\pi \times \frac{3}{4} = \frac{3\pi}{2} = P$ (Period)
 $\frac{\pi}{4}$ (Phase Shift)
 1 (Vertical Shift)
 up (Direction)

