Trigonometry/Precalculus

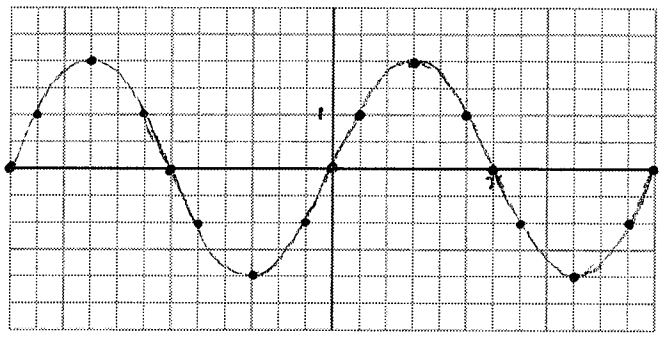
Name _____

§4.5 Graphs of Sine and Cosine Functions ADDITIONAL PRACTICE

Date _____ Pd _____

Sketch the graph of the function by hand. Identify the amplitude, period, phase shift, and vertical shift of the graph.

1. $y = 2\sin(x)$



1st pt

$x = 0$

$y = 2(0)$

$y = 0$

2nd pt

$x = \frac{\pi}{6}$ (1 sq)

$y = 2(\frac{1}{2})$

$y = 1$

3rd pt

$x = \frac{\pi}{2}$ (3 sq)

$y = 2(1)$

$y = 2$

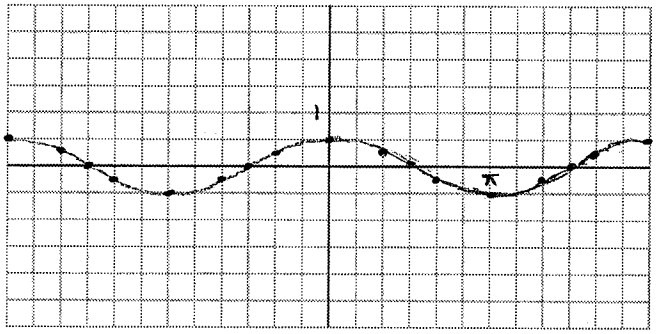
amp 2

period 2π

PS none

VS none

2. $y = 0.5\cos(x)$



1st pt

$x = \frac{\pi}{2}$ (3 sq)

$y = 0.5(0)$

$y = 0$

2nd pt

$x = \frac{\pi}{3}$ (2 sq)

$y = 0.5(0.5)$

$y = 0.25$

3rd pt

$x = 0$

$y = 0.5(1)$

$y = 0.5$

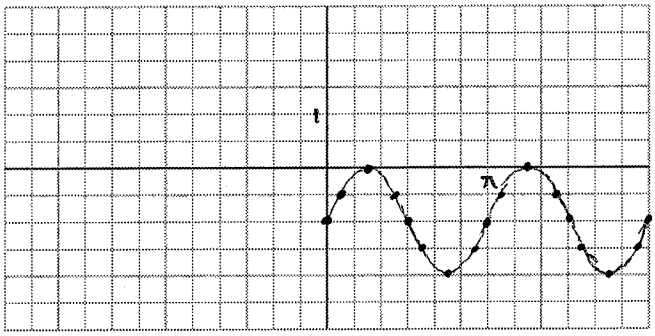
amp 0.5

period 2π

PS none

VS none

3. $y = \sin(2x) - 1$



1st pt

$\frac{2x}{2} = \frac{0}{2}$

$x = 0$

$y = 0 - 1$

$y = -1$

2nd pt

$\frac{2x}{2} = \frac{\pi}{6} \cdot \frac{1}{2}$

$x = \frac{\pi}{12}$

$y = 0.5 - 1$

$y = -0.5$

$\frac{2x}{2} = \frac{1}{2}$

$x = \frac{1}{2}$ sq

3rd pt

$\frac{2x}{2} = \frac{\pi}{2} \cdot \frac{1}{2}$

$x = \frac{\pi}{4}$

$y = 1 - 1$

$y = 0$

$\frac{2x}{2} = \frac{3}{2}$

$x = 1.5$ sq

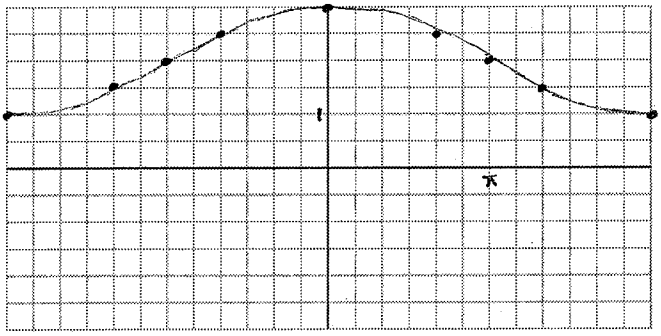
amp 1

period π

PS none

VS 1 down

4. $y = \cos\left(\frac{x}{2}\right) + 2$



1st pt

$2 \cdot \frac{x}{2} = \frac{\pi}{2} \cdot 2$

$x = \pi$

$y = 0 + 2$

$y = 2$

$2 \cdot \frac{x}{2} = 3 \cdot 2$

$x = 6$ sq

2nd pt

$2 \cdot \frac{x}{2} = \frac{\pi}{3} \cdot 2$

$x = \frac{2\pi}{3}$

$y = 0.5 + 2$

$y = 2.5$

$2 \cdot \frac{x}{2} = 2 \cdot 2$

$x = 4$ sq

3rd sq

$2 \cdot \frac{x}{2} = 0 \cdot 2$

$x = 0$

$y = 1 + 2$

$y = 3$

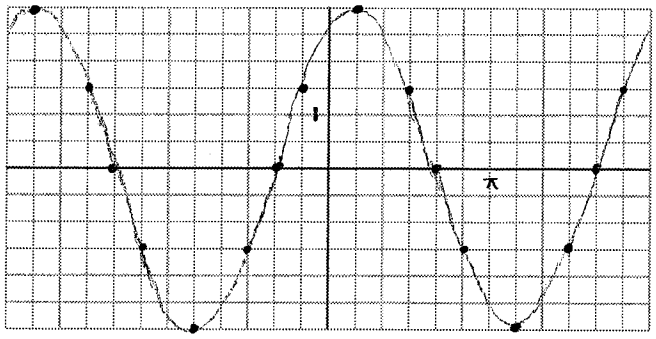
amp 1

period 4π

PS none

VS 2 up

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



1st pt

$x + \frac{\pi}{3} = 0$

$-\frac{\pi}{3} \quad -\frac{\pi}{3}$

$x = -\frac{\pi}{3}$

$x + 2 = 0$

$-2 \quad -2$

$x = -2$ sq

$y = 3 \cdot 0$

$y = 0$

2nd pt

$x + \frac{\pi}{3} = \frac{\pi}{6}$

$-\frac{\pi}{3} \quad -\frac{2\pi}{6}$

$x = -\frac{\pi}{6}$

$x + 2 = 1$

$-2 \quad -2$

$x = -1$ sq

$y = 3(0.5)$

$y = 1.5$

3rd pt

$x + \frac{\pi}{3} = \frac{\pi}{2}$

$-\frac{\pi}{3} \quad -\frac{\pi}{3}$

$x = \frac{2\pi}{6} - \frac{2\pi}{6}$

$x = \frac{\pi}{6}$

$x + 2 = 3$

$-2 \quad -2$

$x = 1$ sq

$y = 3 \cdot 1$

$y = 3$

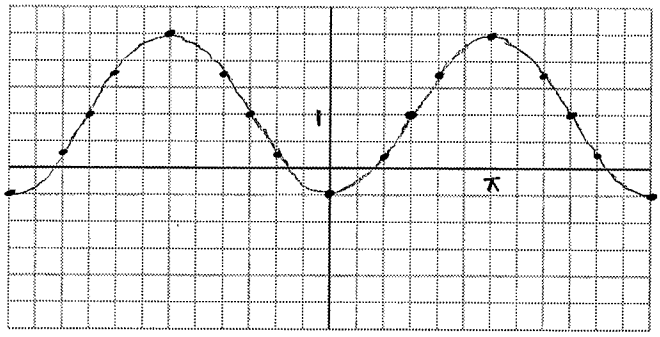
amp 3

period 2π

PS $\pi/3$ left

VS none

6. $y = -1.5\cos(x) + 1$



1st pt

$x = \frac{\pi}{2}$ (3 sq)

$y = -1.5(0) + 1$

$= 0 + 1$

$y = 1$

2nd pt

$x = \frac{\pi}{3}$ (2 sq)

$y = -1.5(0.5) + 1$

$= -0.75 + 1$

$= 0.25$

3rd pt

$x = 0$

$y = -1.5(1) + 1$

$= -1.5 + 1$

$y = -0.5$

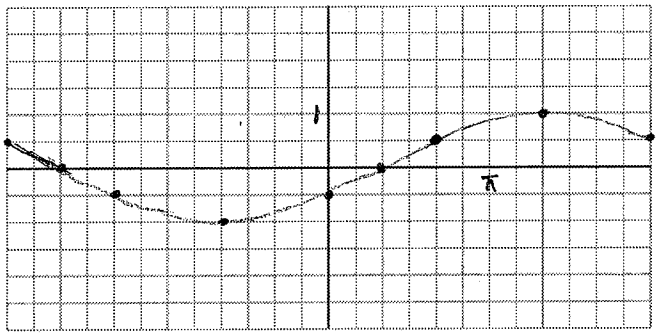
amp 1.5

period 2π

PS none

VS 1 up

7. $y = \sin\left(\frac{x}{2} - \frac{\pi}{6}\right)$



1st pt

$\frac{x}{2} - \frac{\pi}{6} = 0$ $\quad \left(\frac{x}{2} - 1 = 0\right)\cdot 2$ $\quad y = 0$

$+\frac{\pi}{6} \quad +\frac{\pi}{6}$ $\quad x - 2 = 0$

$+2 \quad +2$

$2 \cdot \frac{x}{2} = \frac{\pi}{6} \cdot 2$ $\quad x = 2$ sq

$x = \frac{\pi}{3}$

2nd pt

$\frac{x}{2} - \frac{\pi}{6} = \frac{\pi}{6}$ $\quad \left(\frac{x}{2} - 1 = 1\right)\cdot 2$ $\quad y = 0.5$

$+\frac{\pi}{6} \quad +\frac{\pi}{6}$ $\quad x - 2 = 2$

$+2 \quad +2$

$2 \cdot \frac{x}{2} = \frac{\pi}{3} \cdot 2$ $\quad x = 4$ sq

$x = \frac{2\pi}{3}$

3rd pt

$\frac{x}{2} - \frac{\pi}{6} = \frac{\pi}{2}$ $\quad \left(\frac{x}{2} - 1 = 3\right)\cdot 2$ $\quad y = 1$

$+\frac{\pi}{6} \quad +\frac{\pi}{6}$ $\quad x - 2 = 6$

$+2 \quad +2$

$\frac{x}{2} = \frac{2\pi}{6} + \frac{\pi}{6}$ $\quad x = 8$ sq

$2 \cdot \frac{x}{2} = \frac{2\pi}{3} \cdot 2$

$x = \frac{4\pi}{3}$

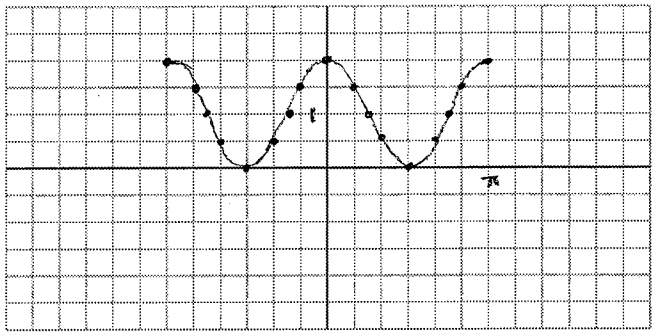
amp 1

period 4π

PS $\pi/3$ right

VS none

8. $y = \cos(2x) + 1$



1st pt

$\frac{2x}{2} = \frac{\pi}{2} \cdot \frac{1}{2}$ $\quad \frac{2x}{2} = \frac{3}{2} \cdot \frac{2}{2}$

$x = \frac{\pi}{4}$ $\quad x = 1.5$ sq

$y = 0 + 1$

$y = 1$

2nd pt

$\frac{2x}{2} = \frac{\pi}{3} \cdot \frac{1}{2}$ $\quad \frac{2x}{2} = \frac{2}{2} \cdot \frac{2}{2}$

$x = \frac{\pi}{6}$ $\quad x = 1$ sq

$y = 0.5 + 1$

$y = 1.5$

3rd pt

$\frac{2x}{2} = \frac{0}{2} \cdot \frac{2}{2}$

$x = 0$

$y = 1 + 1$

$y = 2$

amp 1

period π

PS none

VS 1 up