

September 27



What is your favorite part of homecoming?

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Students will verbally explain how to
graph sine and cosine functions
(using the words:
range, right triangles, periodic...)

Graph $y = 3 \cos(4x - \pi) + 1$

(1) Amplitude = 3 (y-values)

This will change the range from $-1 \leq y \leq 1$ to $-3 \leq y \leq 3$

(2) Vertical Shift = 1

This will change the range from $-3 \leq y \leq 3$ to $-2 \leq y \leq 4$

midline $y = 1$

Graph $y = 3 \cos(4x - \pi) + 1$

(3) Find the period using the equation: $\frac{2\pi}{b}$

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

Period = $\frac{\pi}{2}$

(4) Find the start, end, middle and quarter points for the period, these are X-values.

Start = 0

End = $\frac{\pi}{2}$

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

1st Quarter = $\frac{\pi}{8}$

3rd Quarter = $\frac{3\pi}{8}$

$$\begin{aligned} \frac{(\frac{\pi}{4} + 0)}{2} &= \frac{\frac{\pi}{4}}{2} \\ &= \frac{\pi}{4} \cdot \frac{1}{2} = \frac{\pi}{8} \end{aligned}$$

$$\begin{aligned} \frac{(\frac{\pi}{2} + 0)}{2} &= \frac{\frac{\pi}{2}}{2} = \frac{\pi}{4} \end{aligned}$$

$$\begin{aligned} \frac{(\frac{\pi}{4} + \frac{\pi}{2})}{2} &= \frac{\frac{\pi}{4} + \frac{2\pi}{4}}{2} \\ &= \frac{\frac{3\pi}{4}}{2} = \frac{3\pi}{4} \cdot \frac{1}{2} = \frac{3\pi}{8} \end{aligned}$$

Graph $y = 3 \cos(4x - \pi) + 1$

(5) Find the horizontal shift using the equation: $-\frac{C}{B}$

$$\frac{-(-\pi)}{4} = \frac{\pi}{4}$$

$$H.S. = \frac{\pi}{4}$$

(6) Add the horizontal shift each point

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

$$0 + \frac{\pi}{4} = \frac{\pi}{4}$$

1st Quarter = $\frac{3\pi}{8}$

$$\frac{\pi}{8} + \frac{\pi}{4} = \frac{\pi}{8} + \frac{2\pi}{8} = \frac{3\pi}{8}$$

Middle = $\frac{\pi}{2}$



$$\frac{\pi}{4} + \frac{\pi}{4} = \frac{2\pi}{4} = \frac{\pi}{2}$$

3rd Quarter = $\frac{5\pi}{8}$

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

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

$$\frac{3\pi}{8} + \frac{\pi}{4} = \frac{3\pi}{8} + \frac{2\pi}{8} = \frac{5\pi}{8}$$

(7) Sketch and label your graph

from $-1 \leq y \leq 1$ to $-3 \leq y \leq 3$

(6) Add the horizontal shift each point

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

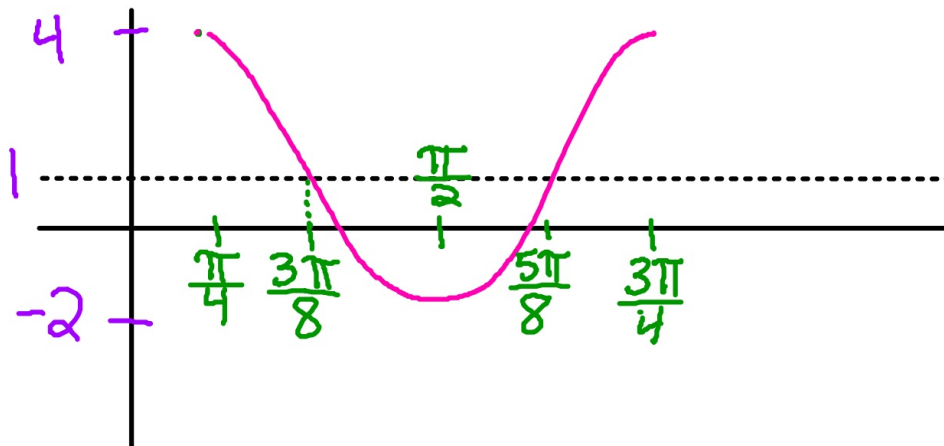
Middle = $\frac{\pi}{2}$

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

from $-3 \leq y \leq 3$ to $-2 \leq y \leq 4$
(midline of $y = 1$)

1st Quarter = $\frac{3\pi}{8}$

3rd Quarter = $\frac{5\pi}{8}$



Graph $y = -2 \sin(\pi x + 2\pi) + 1$

(1) Amplitude = 2 (y-values)

This will change the range from $-1 \leq y \leq 1$ to $-2 \leq y \leq 2$

(2) Vertical Shift = 1

This will change the range from $-2 \leq y \leq 2$ to $-1 \leq y \leq 3$
 With a midline of $y =$ 1

Graph $y = -2 \sin(\pi x + 2\pi) + 1$

(3) Find the period using the equation: $\frac{2\pi}{B}$

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

Period = 2

(4) Find the start, end, middle and quarter points for the period, these are x-values.

Start = 0

End = 2

Middle = 1

1st Quarter = $\frac{1}{2}$

3rd Quarter = $\frac{3}{2}$

$$\frac{(\text{Start} + \text{Middle})}{2}$$

$$\frac{(\text{Middle} + \text{End})}{2}$$

Graph $y = -2\sin(\pi x + 2\pi) + 1$

(5) Find the horizontal shift using the equation: $-\frac{C}{B}$

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

Horizontal Shift = -2

(6) Add the horizontal shift each point

Start = -2

End = 0

$0 + -2$

Middle = -1

$2 + -2$

1st Quarter = $-\frac{3}{2}$

3rd Quarter = $-\frac{1}{2}$

$\frac{1}{2} + -2$

$\frac{3}{2} + -2$

\downarrow
 $1 + -2$

(Previous Point plus Horiz. Shift)

Graph $y = -2\sin(\pi x + 2\pi) + 1$

(5) Find the horizontal shift using the equation: _____

from _____ $-2 \leq y \leq 2$

Horizontal Shift = _____

(6) Add the horizontal shift each point

from _____ $-1 \leq y \leq 3$

Start = -2

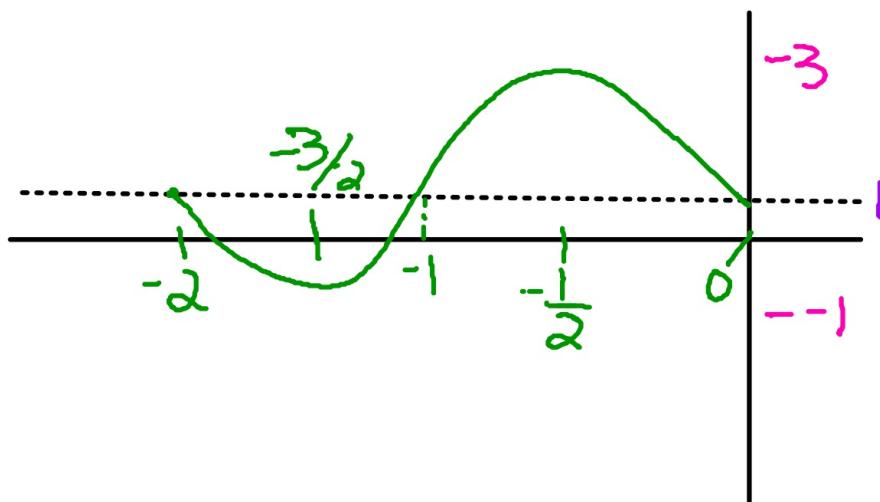
-1

End = 0

Middle =

1st Quarter = $-\frac{3}{2}$

3rd Quarter = $-\frac{1}{2}$



pg 166 #3 - 12 (multiples of 3), 17, 19, 21,
43, 45, 48, 49, 51, 54, 55, 57, 58