Write an equation for a sine curve that has the given amplitude and period, and which passes through the given point.

10) Amplitude 10, period $\frac{\pi}{3}$, point (0, 0)

Solve the problem.

11) Tides go up and down during a 12.4 hour period(half lunar day). The average depth of a certain river is 10 m and ranges from a low tide of 7 m to a high tide of 13 m. The variation can be approximated by a sinusoidal curve.

a) Write an equation that gives the approximate variation y, if x is the number of hours after midnight if high tide occurs at 9:00 am.

b) Determine the height of the tide at 11 am.

c) Determine the time of day that the height of the tide is 12 m.

12) The average high temperatures for Grand Junction, CO are given below.

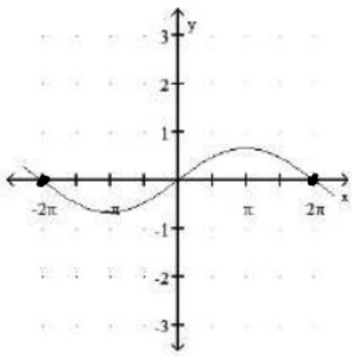
Month	1	2	3	4	5	6	7	8	9	10	11	12
Temperature (°F)	37	45	56	64	75	87	92	90	80	67	50	39

Model this data using your calculator and then using that model, predict the temperature during the 6th month. How close is this prediction to the actual temperature during that month?

$y = 27.150 \sin(.50586x - 1.969) + 64.236$

$87.997 \approx 88^\circ$

13) Write 2 equations for the graph below. One equation as sine and one equation as cosine.



period = 4π $\longrightarrow$ $b = \frac{2\pi}{4\pi} = \frac{1}{2}$

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

$y = \frac{2}{3}\sin\frac{1}{2}x$

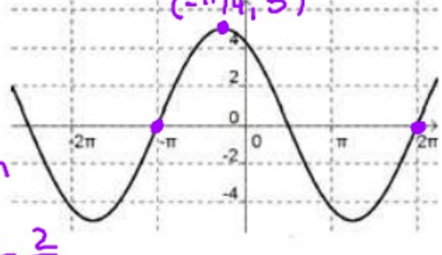
$y = \frac{2}{3}\cos\frac{1}{2}\left(x - \frac{1}{4}(4\pi)\right)$

$y = \frac{2}{3}\cos\frac{1}{2}(x - \pi)$

x value of max

14) Write 2 equations for the graph below. One equation as sine and one equation as cosine.

$(-\pi/4, 5)$



period = 3π

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

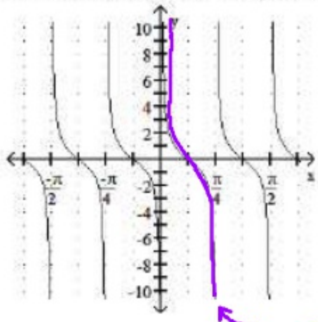
$y = 5\cos\frac{2}{3}\left(x + \frac{\pi}{4}\right)$

$y = 5\sin\frac{2}{3}\left(x + \frac{\pi}{4} + \frac{1}{4}(3\pi)\right)$

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

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

15) Write an equation for the graph below.



y-axis period = $\frac{\pi}{4}$

$y = \cot 4x$

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