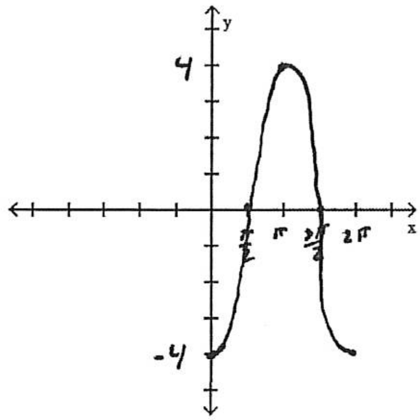
Trigonometry PracticeTest C (Graphing and Identities)
Name______________________________

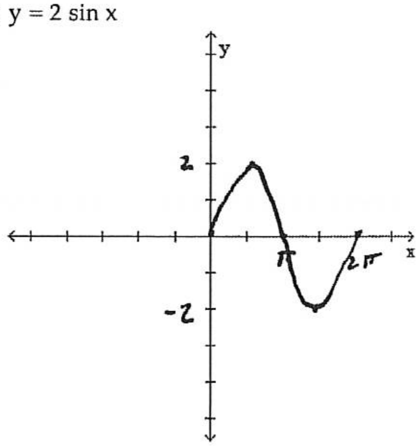
For problems 1 - 4 , graph one period of the function.

1) $y = -4 \cos x$



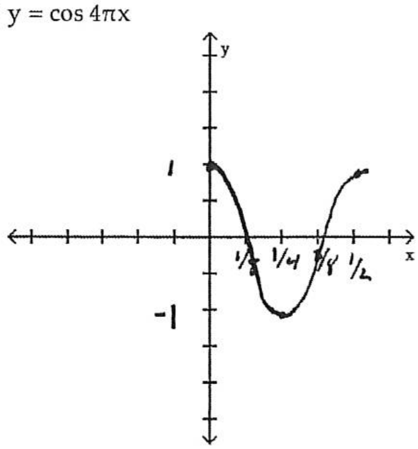
Amp 4
Per = 2π

2) $y = 2 \sin x$



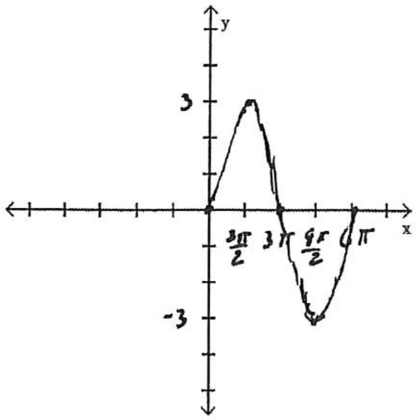
Amp = 2
Per = 2π

3) $y = \cos 4\pi x$



Amp = 1
Per $\frac{2\pi}{4\pi} = \frac{1}{2}$

4) $y = 3\sin\frac{1}{3}x$

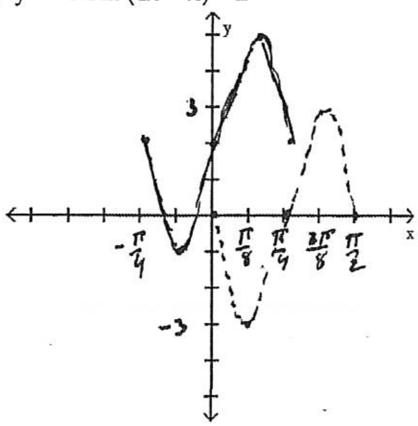


Amp 3

Per $\frac{2\pi}{\frac{1}{3}} = 6\pi$

Find the amplitude, period, phase shift, and vertical shift. Then Graph the function

5) $y = -3\sin(4x + \pi) + 2$



Amp = 3

Reflection over x-axis

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

V.S. up 2

P.S.

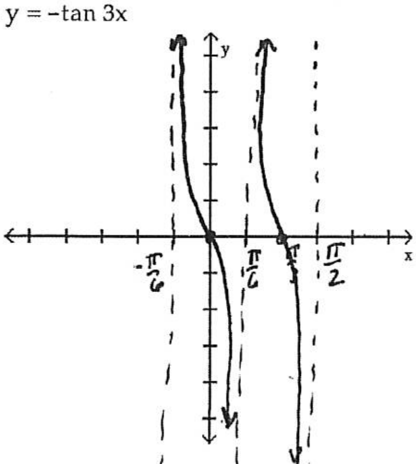
$4x + \pi = 0$

$4x = -\pi$

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

Graph the function.

6) $y = -\tan 3x$



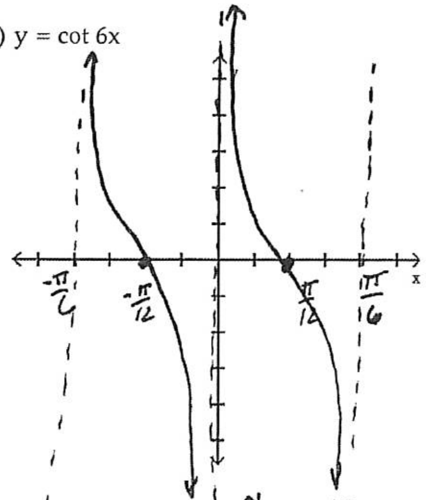
Reflection over x-axis

Period $\frac{\pi}{3}$ ← x-intercepts

1^{st} 2 Asymptotes $\pm\frac{\pi}{6}$

3^{rd} Asymptote $\frac{\pi}{6} + \frac{\pi}{3} = \frac{\pi}{2}$

7) $y = \cot 6x$

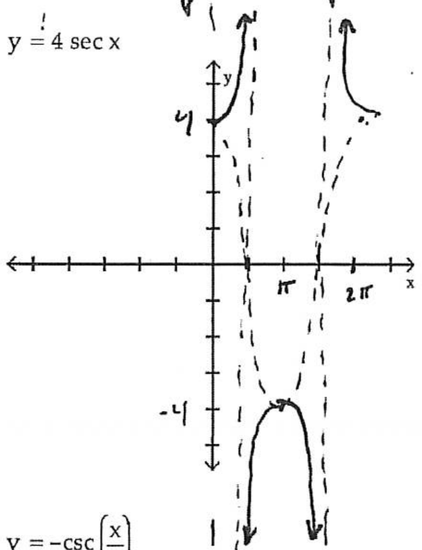


Per $\frac{\pi}{6}$

y-axis alway V.A.

1st 2 Asymptotes I $\frac{\pi}{6}$

8) $y = 4 \sec x$

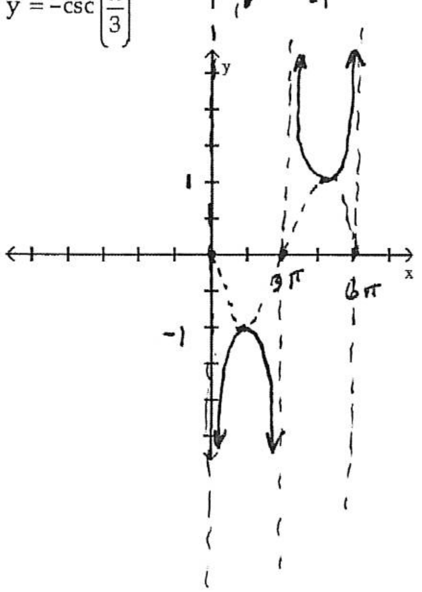


$y = 4\cos x$

Amp 4

Per 2π

9) $y = -\csc\left(\frac{x}{3}\right)$



$y = -\sin \frac{x}{3}$

↑

Reflection over x-axis

Amp = 1

Per = $\frac{2\pi}{\frac{1}{3}} = 6\pi$

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)

$B = \frac{2\pi}{\frac{\pi}{3}} = 6$

$y = 10 \sin 6x$

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.

$A: \frac{13-7}{2} = 3$

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.

$y = A \cos B(x - T) + C$

$C = \frac{13+7}{2} = 10$

$y = 3 \cos \frac{2\pi}{12.4}(x - 9) + 10$

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

$B = \frac{2\pi}{12.4}$

11.586 m

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

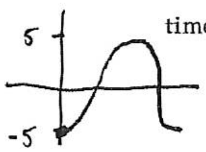
7.34 (.34)(60) 7:20 am

$T = 9$

12) A weight attached to a spring is pulled down 5 inches below the equilibrium position. Assuming that the period of the system is $\frac{1}{8}$ second, determine a trigonometric model that gives the position of the weight at time t seconds.

$y = -A \cos B(x - T) + C$

$A = \frac{5-(-5)}{2} = 5$



$y = -5 \cos 16\pi(x - 0) + 0$

$C = \frac{5+(-5)}{2} = 0$

$B = \frac{2\pi}{\frac{1}{8}} = 16\pi$

$T = 0$

13) 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?

$y = 27.118 \sin(.507x - 1.977) + 64.297$

Predicted Value (June) = 88.009

Actual = 87

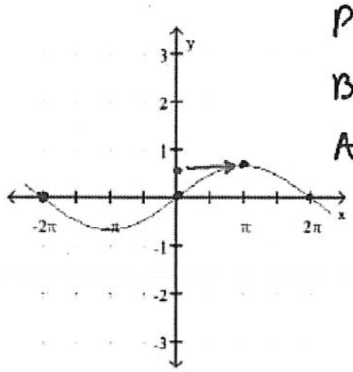
off by 1°

13) 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?

14) Write 2 equations for the graph below. One equation as sine and one equation as cosine. $Y = A \sin B(x-c)+D$



Per 4π

$B = \frac{2\pi}{4\pi} = \frac{1}{2}$

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

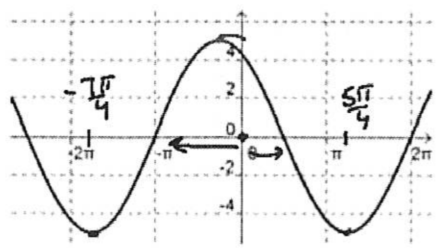
V.S. None

$y = -\frac{1}{2}\sin\frac{1}{2}(x+2\pi)$

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

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

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



Amp 5

Per 3π

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

V.S. None

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

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

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