

Name: _____ Date: _____ Block: _____

Graphing Trig Functions TEST STUDY GUIDE

Test covers:

- Know domain, range, period, and intercepts of the six parent trig functions.
- Find amplitude, period, phase shift, and vertical displacement, as applicable, for all six trig functions. Graph the functions applying transformations using this information.
- Writing equations of trig functions from a verbal description of amplitude, period, phase shift, and/or vertical displacement, or from a given graph.

Practice Questions:

1) Graph each function, finding the requested information.

a) $y = \sin x$

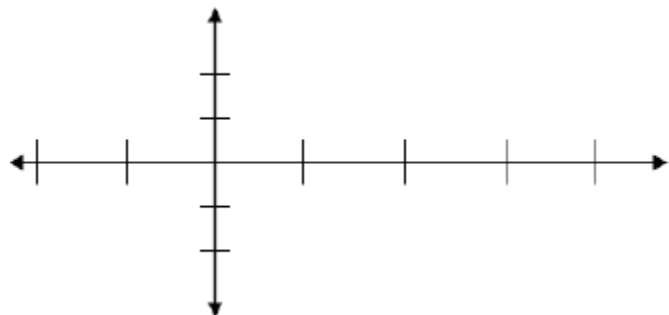
Domain _____

x-ints _____

Range _____

y- int _____

Period _____



b) $y = \cos x$

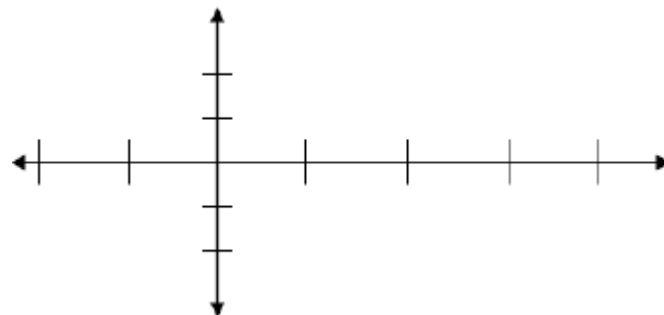
Domain _____

x-ints _____

Range _____

y- int _____

Period _____



c) $y = \tan x$

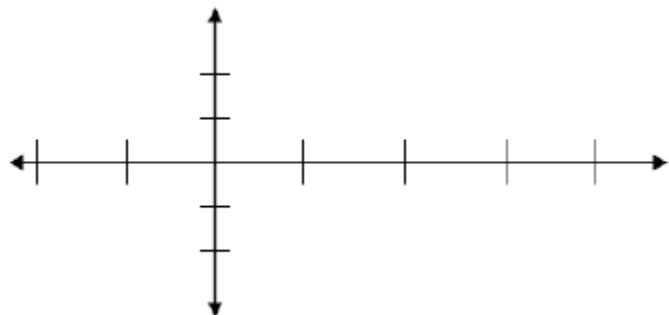
Domain _____

x-ints _____

Range _____

y- int _____

Period _____



d) $y = \cot x$

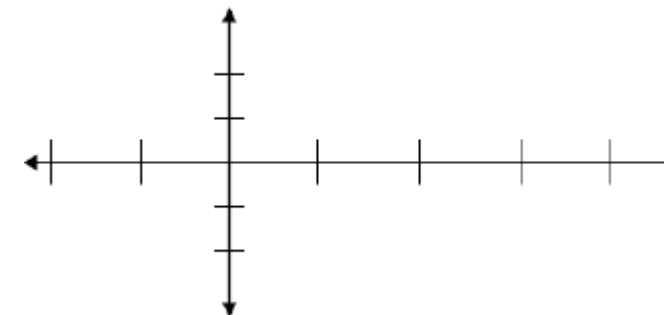
Domain _____

x-ints _____

Range _____

y- int _____

Period _____



e) $y = \csc x$

Domain _____

x-ints _____

Range _____

y- int _____

Period _____

f) $y = \sec x$

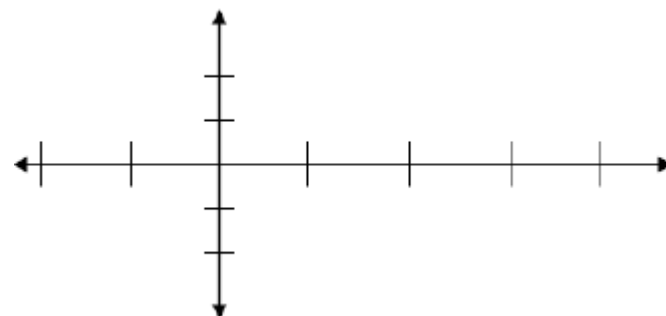
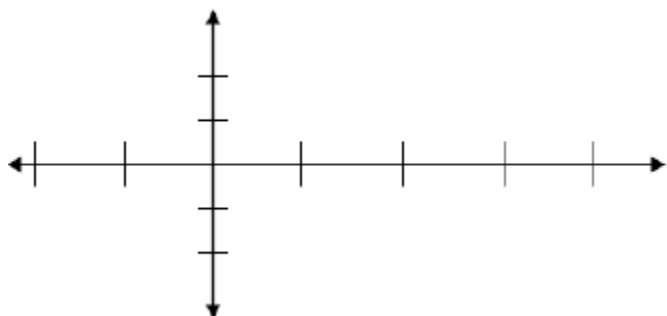
Domain _____

x-ints _____

Range _____

y- int _____

Period _____



2) For each trig function below, identify the applicable values: amplitude, period, phase shift, vertical displacement, and whether graph is reflected.

a) $y = \sin 6x$

b) $y = -5\cos \pi x$

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

d) $y = 3\cos(3x + \pi) - 2$

e) $y = -2\sin\left(x - \frac{\pi}{6}\right) - 5$

f) $y = \csc \frac{\pi}{2} x$

g) $y = \cos \frac{\pi}{3} x$

h) $y = 1 + 4\sec \frac{\pi}{10} x$

i) $y = -1 + 3\cot 2\left(x - \frac{\pi}{6}\right)$

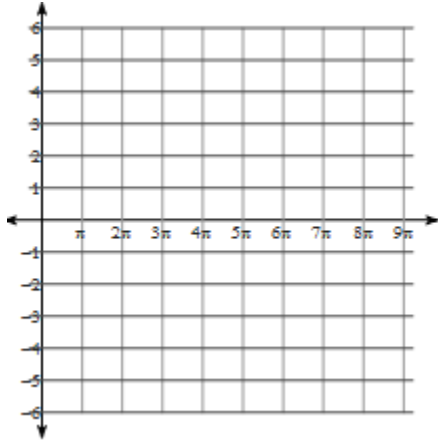
j) $y = 2 + 5\tan \frac{\pi}{8}(x - 3)$

3) Graph the trig functions, finding the applicable values first: amplitude, period, phase shift, vertical displacement, and whether graph is reflected.

a) $y = 4 \cos\left(\frac{x}{3}\right)$

amplitude: _____

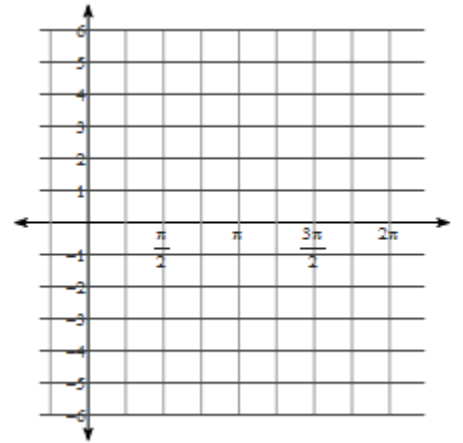
period: _____



b) $y = 4 \sin(2x)$

amplitude: _____

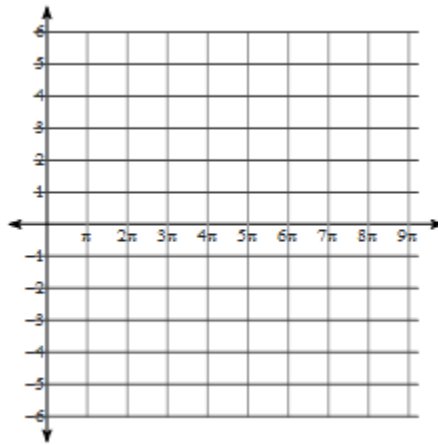
period: _____



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

amplitude: _____

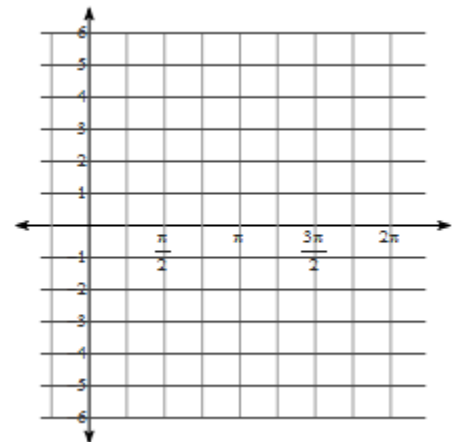
period: _____



d) $y = \cot(2x)$

amplitude: _____

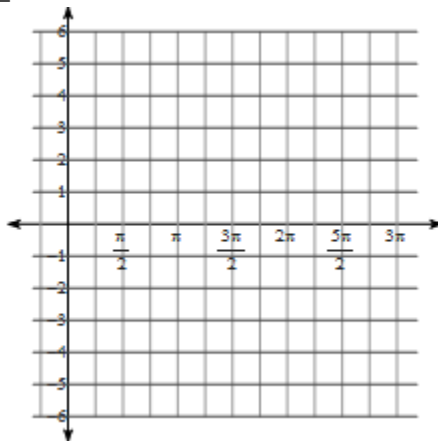
period: _____



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

amplitude: _____

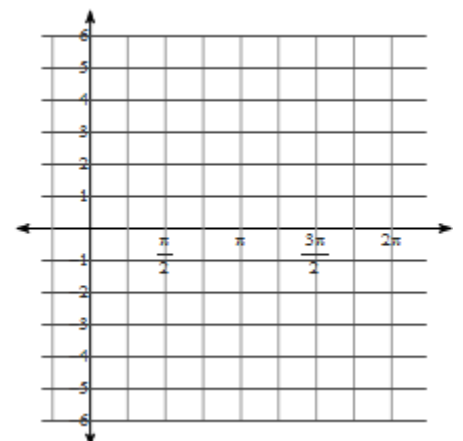
period: _____



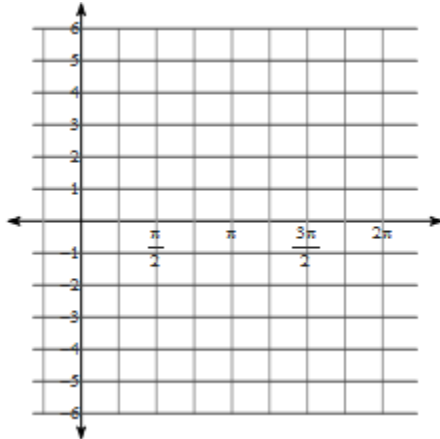
f) $y = \tan\left(x - \frac{\pi}{2}\right)$

amplitude: _____

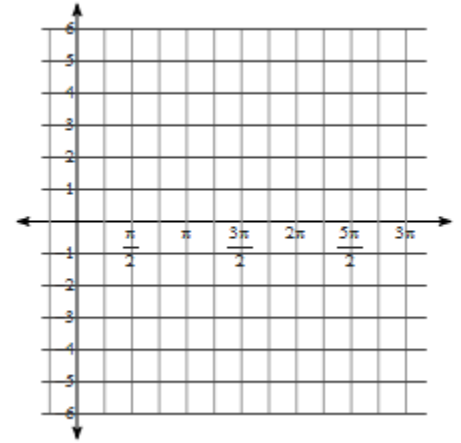
period: _____



g) $y = 2\sin(3x) + 2$
 amplitude: _____
 period: _____

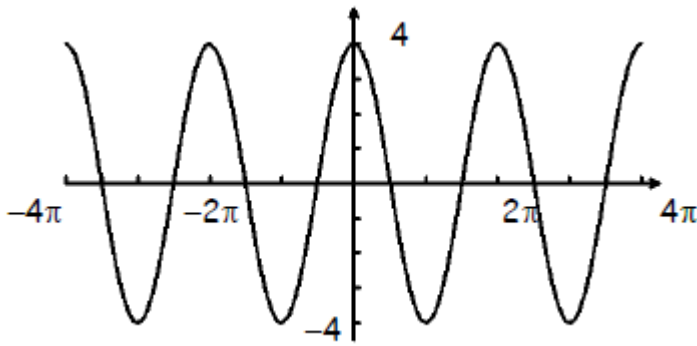


h) $y = \frac{1}{2}\cos\left(x + \frac{\pi}{4}\right) + 2$
 amplitude: _____
 period: _____

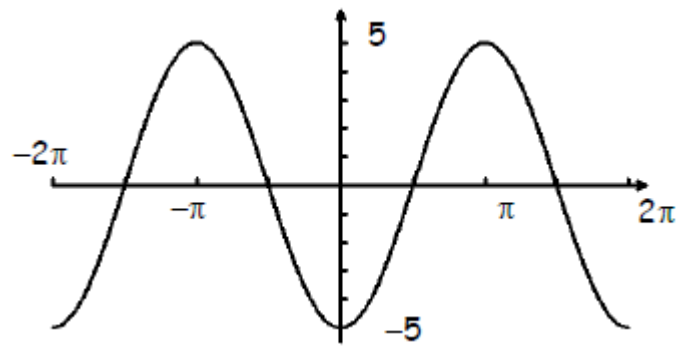


4) Given the graph, find the amplitude and period, then write a trig function.

a)



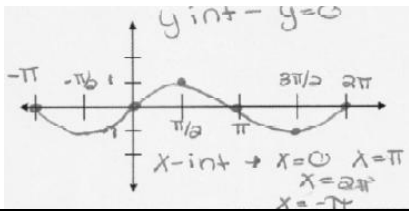
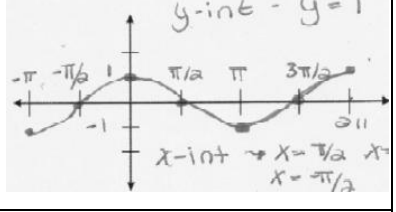
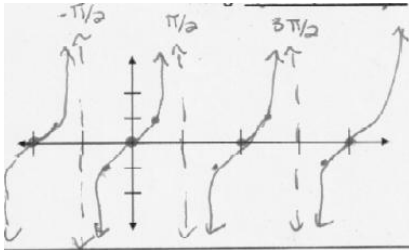

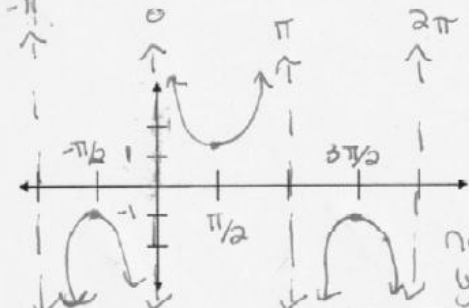
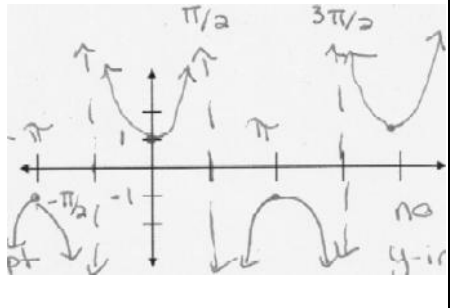
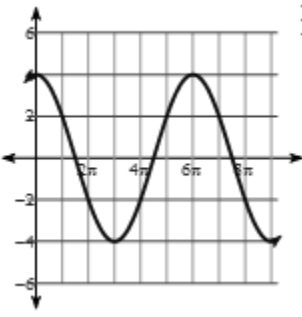
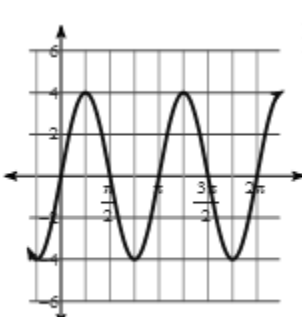
b)

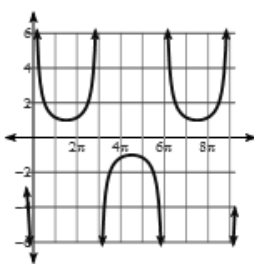
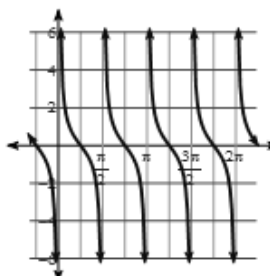
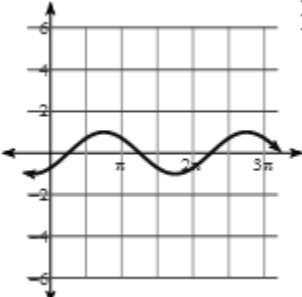
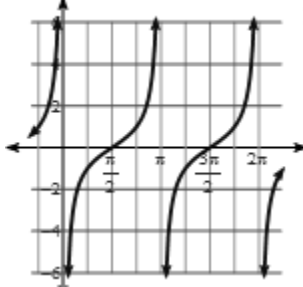
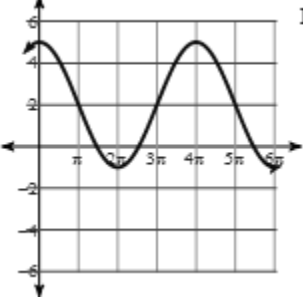
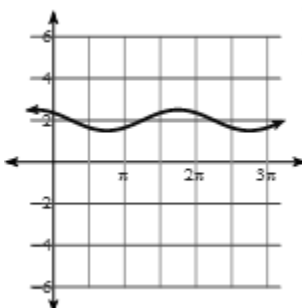


5) Write an equation of a cosine function with amplitude 3, a period of π , a phase shift of $\frac{\pi}{4}$ to the left, and translated 1 unit up.

6) Write an equation of a sine graph with a phase shift right 3, a period of 5π , a vertical translation down 6, and an amplitude of 3.

STUDY GUIDE ANSWERS

| | |
|---|---|
| <p>1) a) $D=(-\infty, +\infty)$; $R=[-1, 1]$; period: 2π; x-ints: $n\pi$; y-int: 0</p>  | <p>b) $D=(-\infty, +\infty)$; $R=[-1, 1]$; period: 2π; x-ints: $\frac{n\pi}{2}$; y-int: 1</p>  |
| <p>c) $D=\text{all R except } \frac{\pi}{2} + n\pi$; $R=(-\infty, +\infty)$; period: π; x-ints: $n\pi$; y-int: 0</p>  | <p>d) $D=\text{all R except } n\pi$; $R=(-\infty, +\infty)$; period: π; x-ints: $\frac{\pi}{2} + n\pi$; y-int: none</p>  |
| <p>e) $D=\text{all R except } n\pi$; $R=(-\infty, -1] \cup [1, \infty)$; period: 2π; x-ints: none; y-int: none</p>  | <p>f) $D=\text{all R except } \frac{\pi}{2} + n\pi$; $R=(-\infty, -1] \cup [1, \infty)$; period: 2π; x-ints: none; y-int: 1</p>  |
| <p>2) a) amp.: 1; period: $\frac{\pi}{3}$</p> | <p>b) amp.: 5; period: 2; reflected</p> |
| <p>c) amp: 1; period π; phase shift: $\frac{\pi}{3}$ left; translate up 2; reflected</p> | <p>d) amp: 3; period: $\frac{2\pi}{3}$; phase shift: $\frac{\pi}{3}$ left; translate down 2</p> |
| <p>e) amp: 2; period: 2π; phase shift: $\frac{\pi}{6}$ right; translate down 5; reflected</p> | <p>f) amp: n/a; period: 4</p> |
| <p>g) amp: 1; period: 6</p> | <p>h) amp: n/a; period 40; translate up 1</p> |
| <p>i) amp: n/a; period: $\frac{\pi}{2}$; phase shift: $\frac{\pi}{6}$ right; translate down 1</p> | <p>j) amp: n/a; period 8; phase shift: 3 right; translate up 2</p> |
| <p>3) a)</p>  | <p>b)</p>  |

| | |
|--|---|
| <p>c)</p>  <p>Amplitude: None Period: 6π</p> | <p>d)</p>  <p>Amplitude: None Period: $\frac{\pi}{2}$</p> |
| <p>e)</p>  <p>Amplitude: 1 Period: 2π</p> | <p>f)</p>  <p>Amplitude: None Period: π</p> |
| <p>g)</p>  <p>Amplitude: 3 Period: 4π</p> | <p>h)</p>  <p>Amplitude: $\frac{1}{2}$ Period: 2π</p> |
| <p>4) a) amp: 4; period: 2π; $y=4\cos x$ b) amp:5; period 2π; $y = -5\cos x$</p> | <p>5) $y = 3\cos 2\left(x + \frac{\pi}{4}\right) + 1$ or $y = 3\cos\left(2x + \frac{\pi}{2}\right) + 1$</p> |
| <p>6) $y = \sin \frac{2}{5}(x - 3) - 6$</p> | |