Graphing Trigonometric Function

Turn on the calculator. Now press the **Mode** key and make sure all of the following is highlighted.

```
Normal    Sci    Eng
Float    0123456789
Radian      Degree
Func    Par    Pol    Seq
Connected      Dot
Sequential     Simul
Real     a+bi    re^ i
Full     Horiz    G-T
```

Now press the **2nd** key and then the **Zoom** button to get into the **Format** window and make sure all of the following is highlighted.

```
RectGC     Polar GC
CoordOn    CoordOff
GridOff    GridOn
AxesOn     AxesOff
LabelOff   LabelOn
ExprOn     ExprOff
```

Now that you have all of the items highlighted press the **Window** key and set to these values:

```
WINDOW
  Xmin = -π
  Xmax = 2π
  Xscl = π /2
  Ymin = -5
  Ymax = 5
  Yscl = 1
  Xres = 1
```

Okay, Let's graph! Press the **y =** key on the top left row of the calculator. If there is anything on the **:y =** just move the cursor to the line and depress the **Clear** key. Your screen should look like this:
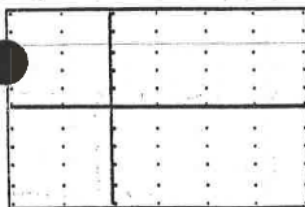
```
:Y₁=
:Y₂=
:Y₃=
:Y₄=
```

Now press **Sin X** to graph y = sin x and press the **Graph** key. You should get this ----
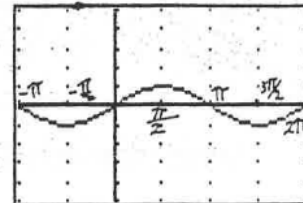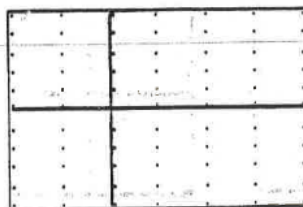
Now you are going to graph some trig functions and record your pictures. Remember we are looking for patterns or characteristics common among these graphs so that we will be able to sketch these graphs without using a graphing calculator.
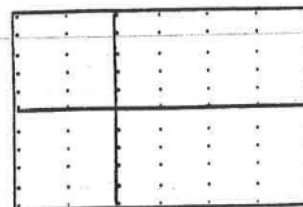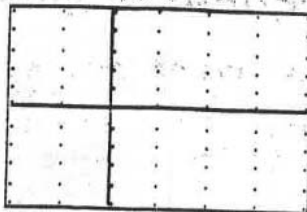
y = 2 sin x

y = 3 sin x

y = 4 sin x

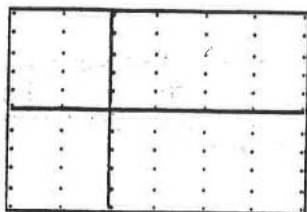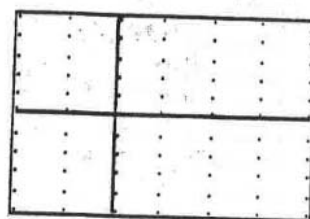$y = \frac{1}{2}$ sin x or .5 sin x

What observations can you make looking at these graphs in relation with y = sin x
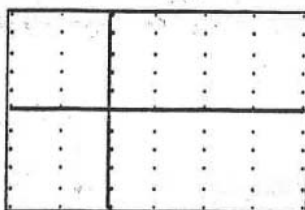
_____

_____
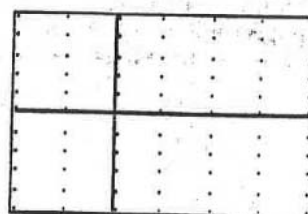
Now graph the following:

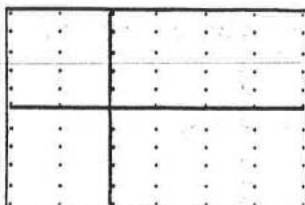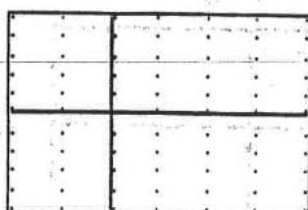y = sin 2x

y = sin 4x

y = sin 8x

y = sin .5x

What observations can you make looking at these graphs in relation with y = sin x
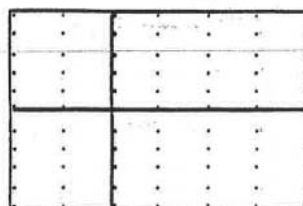
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_____
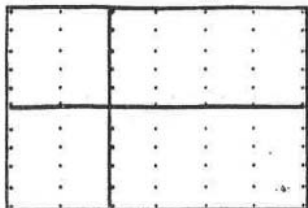
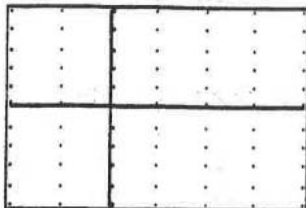Graph these functions
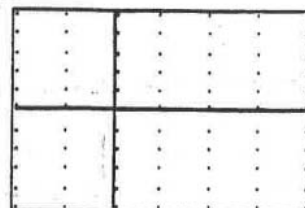y = sin x + 2

y = sin x - 3

y = sin x + 1

Graph these functions:

$y = \sin\left(x + \frac{\pi}{2}\right)$ $y = \sin\left(x - \frac{\pi}{2}\right)$ $y = \sin\left(x + \frac{\pi}{3}\right)$
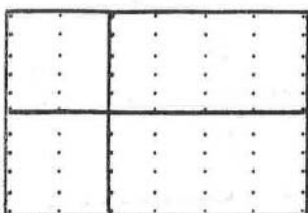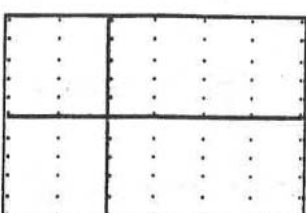
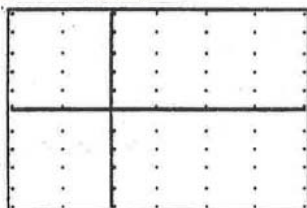$y = \sin\left(x - \frac{\pi}{4}\right)$ $y = \sin\left(x + \frac{\pi}{6}\right)$ $y = \sin\left(x - \frac{\pi}{6}\right)$
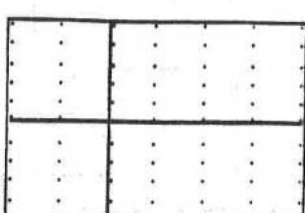
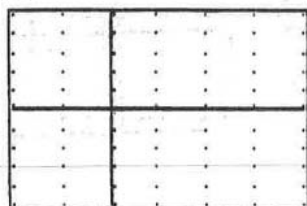What observations can you make looking at these graphs in relation with $y = \sin x$

_____

_____

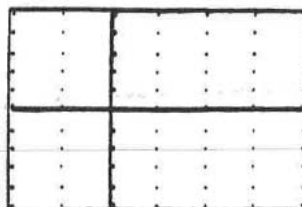Graph $y = -\sin x$

What is your observation:_____

_____

_____

Now Graph the Cosine Curve.

$y = \cos x$ $y = -\cos x$

What is the difference in the two above graphs_____

Using the relationships you observed with the sin curve, sketch the following cosine curves and then enter them into you graphing calculator.
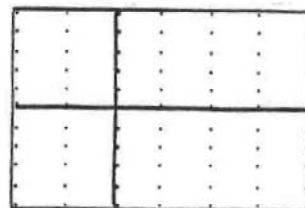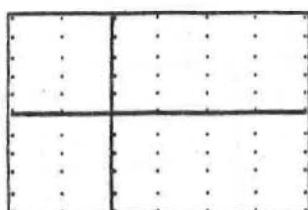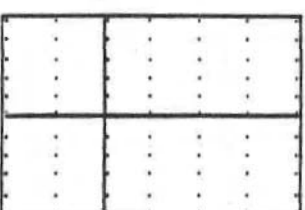
y = 2 cos x

y = cos 2x

y = cos x + 3
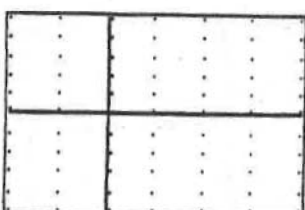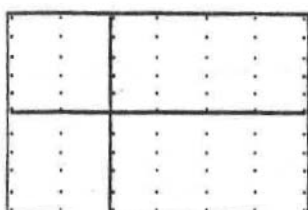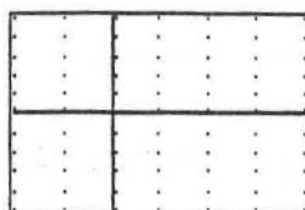
y = 3cos x

y = cos 4x
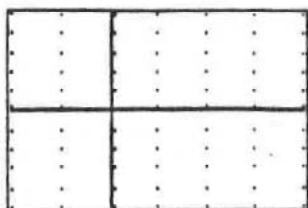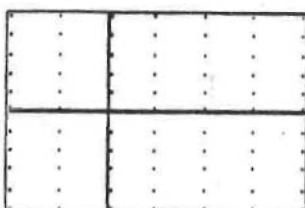
y = cos x − 1

Now try to sketch these first and then check on your calculator
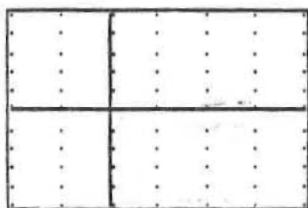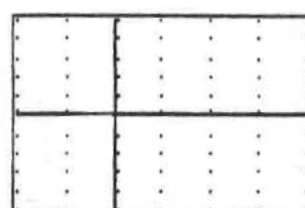
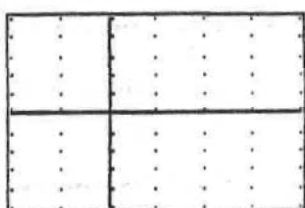y = 2sin x + 2

y = 3cos 2x

y = −3sin x

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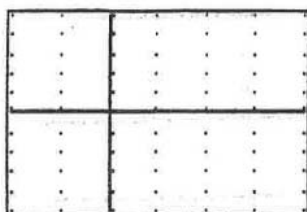
$y = \sin\left(x - \frac{\pi}{3}\right)$

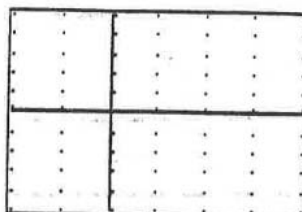$y = \cos\left(x + \frac{\pi}{4}\right)$

wk4_d3.notebook
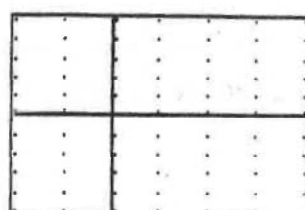
Challenge Problems: Sketch first and then check with the calculator

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

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

This graph will probably not match your sketch. What happened?

Now your teacher will go over some definitions of the following terms.
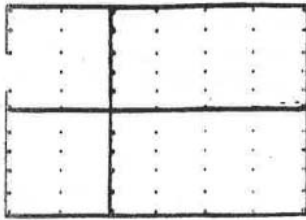
Amplitude -
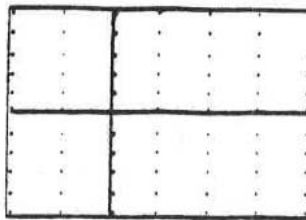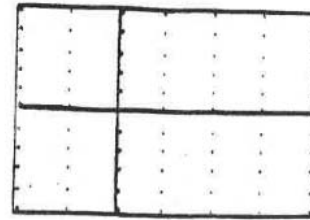
Period -

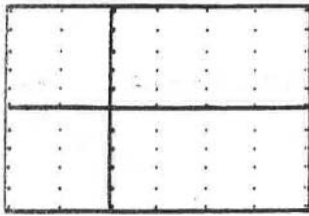Shift-up or Shift-down

Phase-Shift-

-3

$y = \tan x$ $y = \sec x$ $y = \csc x$
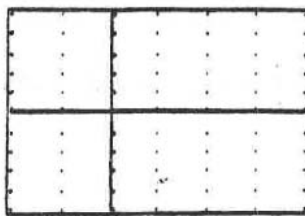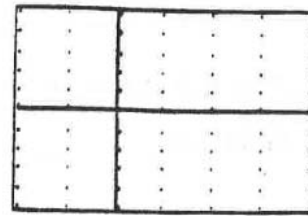
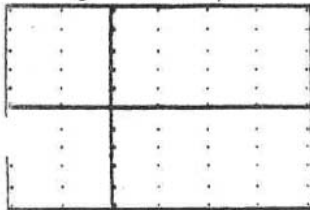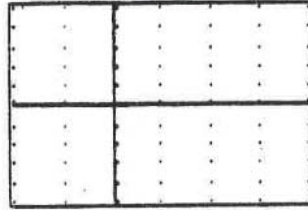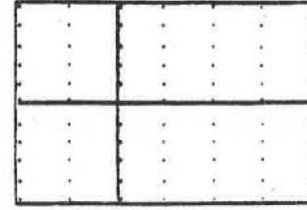$y = \tan 2x$ $y = \sec 2x$ $y = \csc 2x$

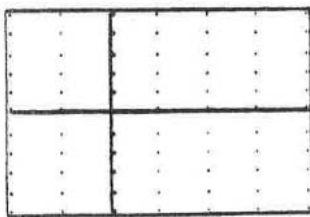$y = 2\tan x$ $y = 2\sec x$ $y = 2\csc x$
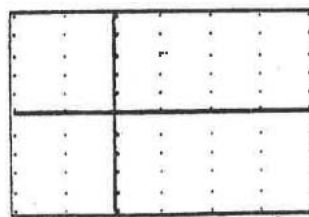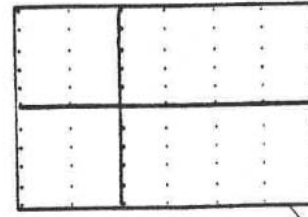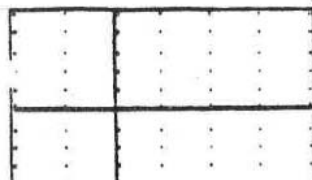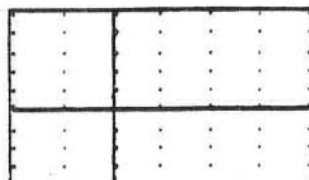
$y = \tan x + 1$ $y = \sec x + 1$ $y = \csc x + 1$

$y = \tan(x - \pi/4)$ $y = \sec(x - \pi/4)$ $y = \csc(x - \pi/4)$