

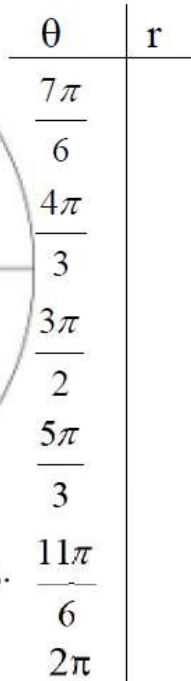
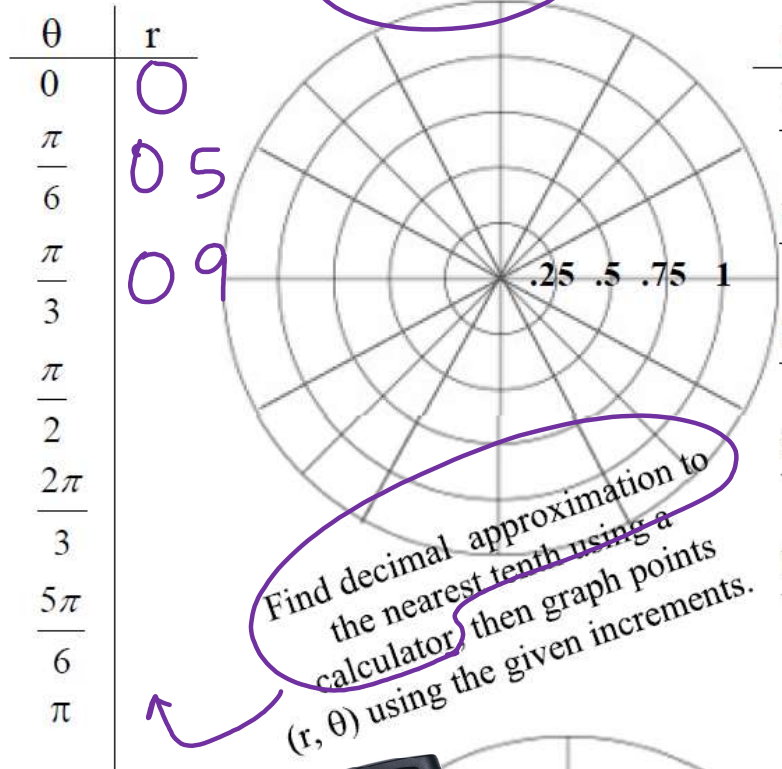
8.2 POLAR GRAPHING

NAME:

PER:

warm up equation: $r = \sin\theta$

warm-up

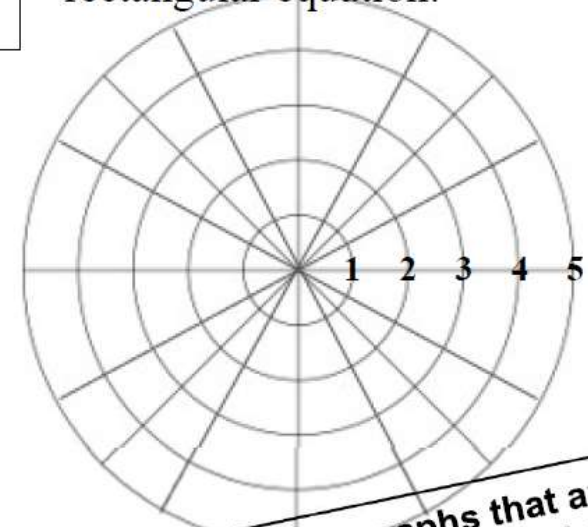


Find decimal approximation to the nearest tenth using a calculator, then graph points (r, θ) using the given increments.



17

given equation:
rectangular equation:



Use fairly increments to draw complete graphs that are points on horizontal & vertical axes.

Use given increments to draw complete graphs that are fairly accurate.

Plot key points on horizontal & vertical axes.

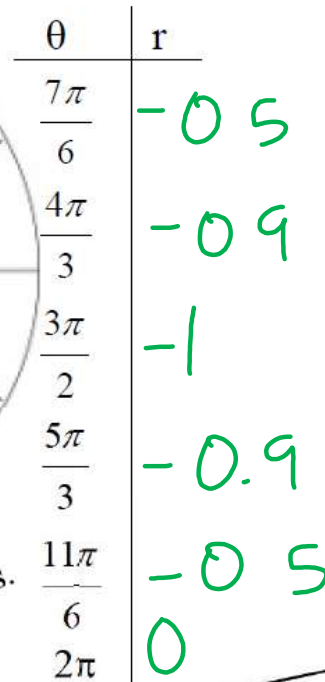
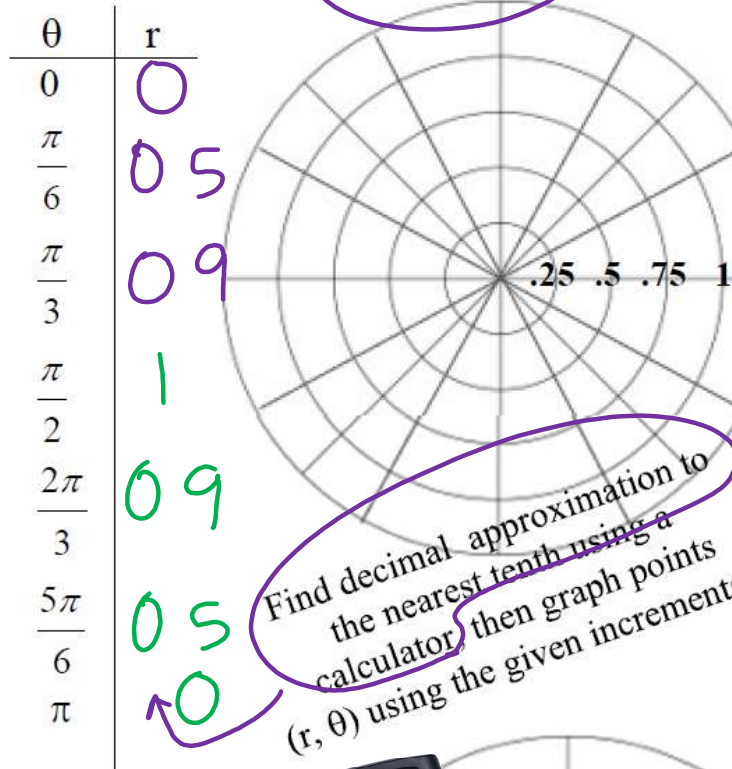
8.2 POLAR GRAPHING

NAME:

PER:

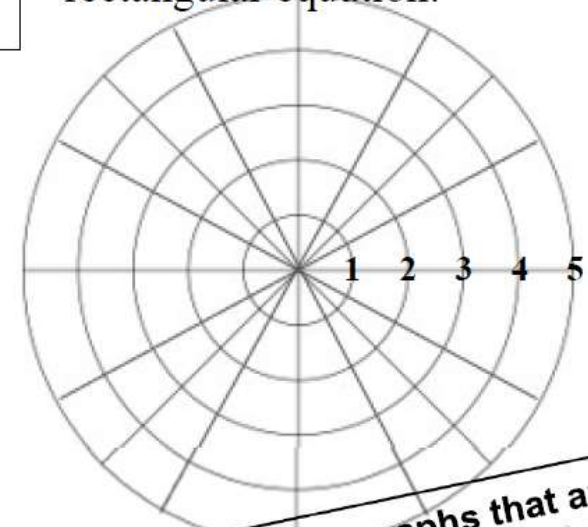
warm up equation: $r = \sin\theta$

warm-up



17

given equation:
rectangular equation:



Use fairly small increments to draw complete graphs that are fairly accurate.

Use given increments to draw complete graphs that are fairly accurate.

Plot key points on horizontal & vertical axes.

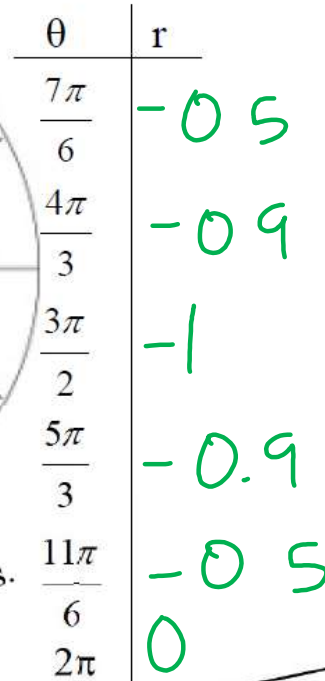
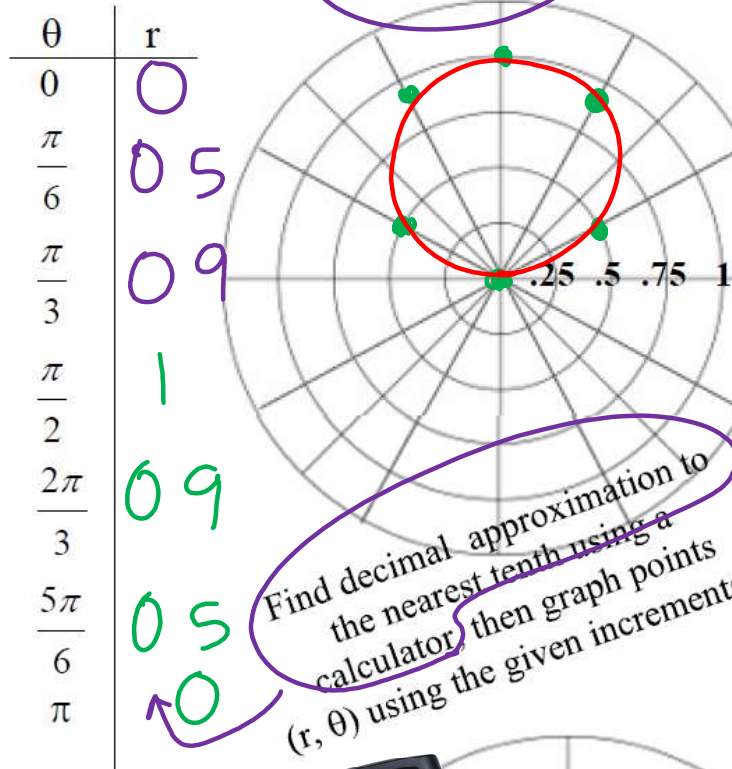
8.2 POLAR GRAPHING

NAME:

PER:

warm up equation: $r = \sin\theta$

warm-up



Find decimal approximation to the nearest tenth using a calculator then graph points (r, θ) using the given increments.

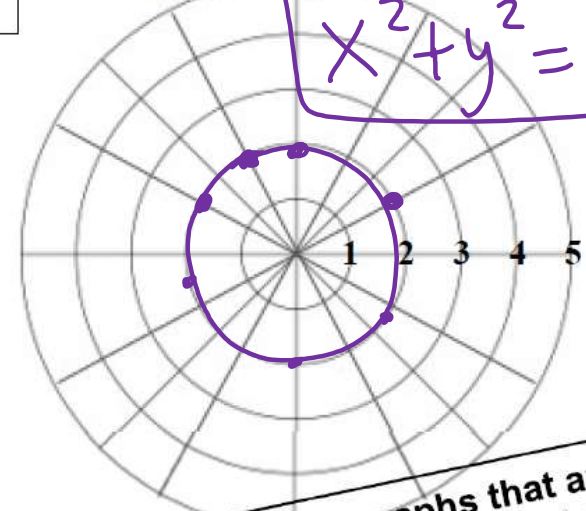


17

given equation:
rectangular equation:

$r = 2$

$x^2 + y^2 = 4$

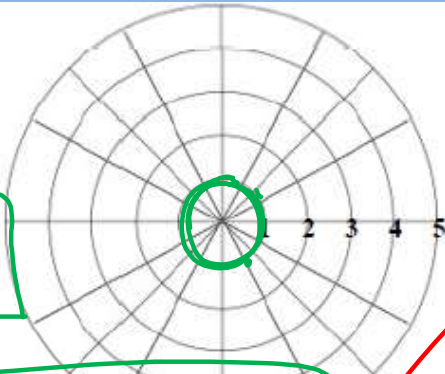


Use fairly... increments to draw complete graphs that are fairly accurate.

Use given increments to draw complete graphs that are fairly accurate.

Plot key points on horizontal & vertical axes.

18



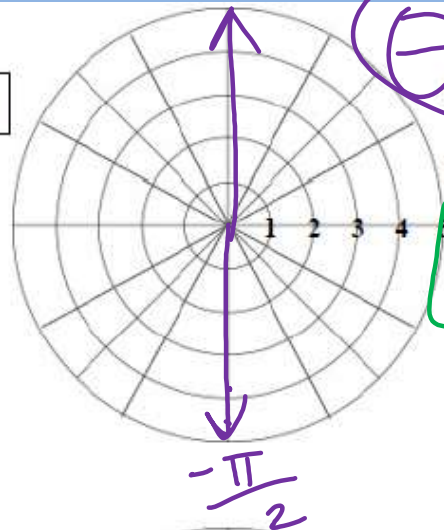
$r = -1$

given equation:

rectangular equation:

$x^2 + y^2 = 1$

19



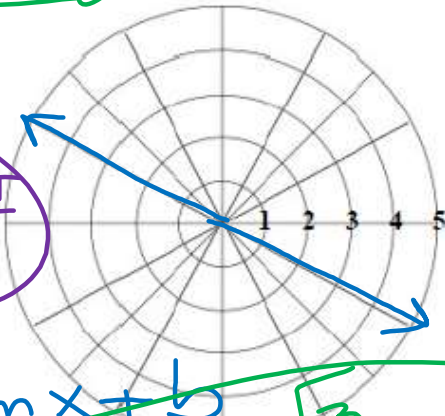
given equation:

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

alternate equation:

$x = 0$

20



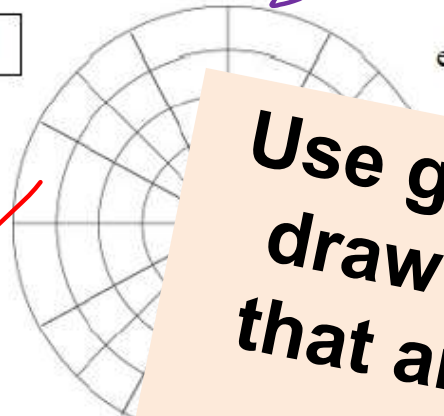
$\theta = \frac{5\pi}{6}$

given equation:

alternate equation:

$y = mx + b$
 $y = -\frac{\sqrt{3}}{3}x$

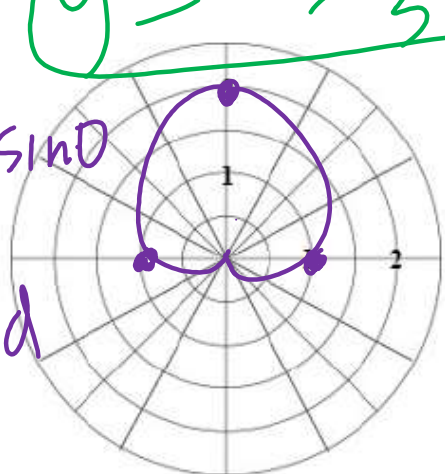
24



equation:

section:

26



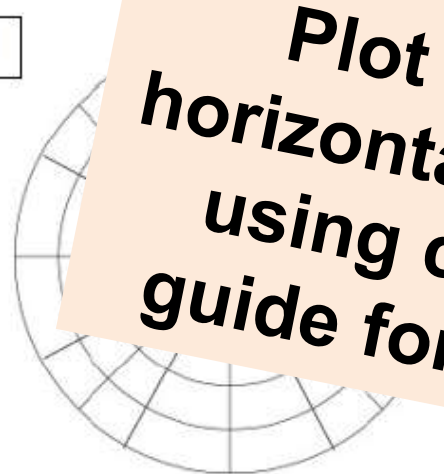
equation:

$r = 1 + \sin\theta$

classification:

cardioid

28



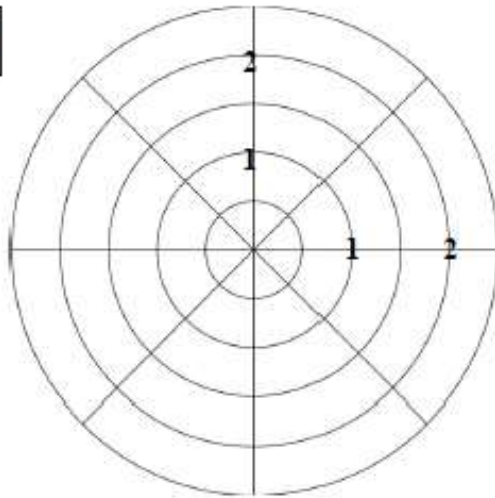
Use given increments to draw complete graphs that are fairly accurate.

Plot key points on horizontal & vertical axes using calculator as a guide for #24-34, 40-44.

30

equation:

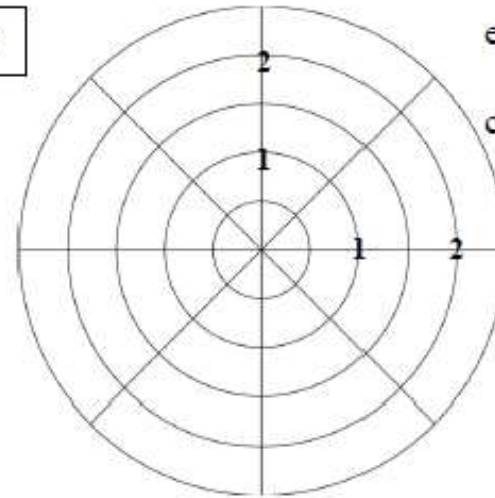
classification:



32

equation:

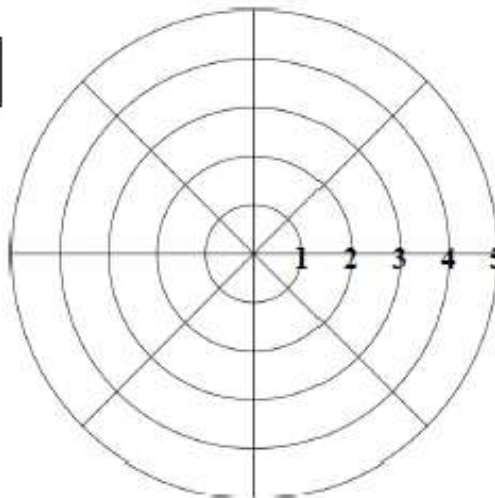
classification:



34

equation:

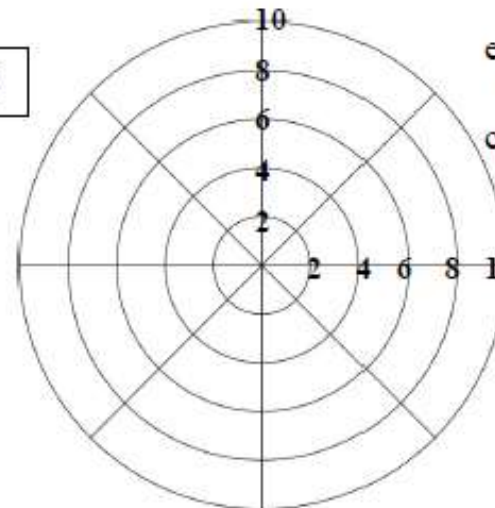
classification:



40

equation:

classification:

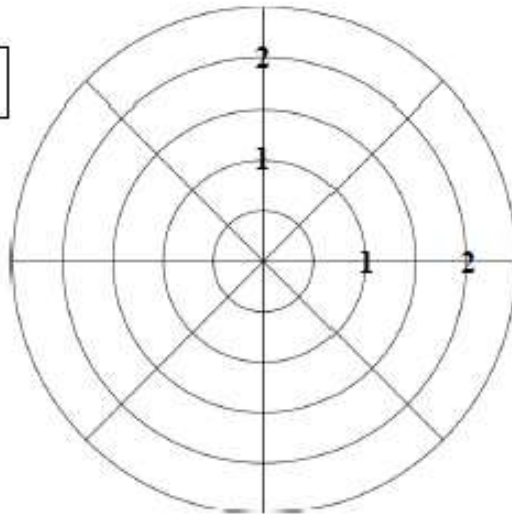


Use given increments to draw complete graphs that are fairly accurate. Plot key points on horizontal & vertical axes.

41

equation:

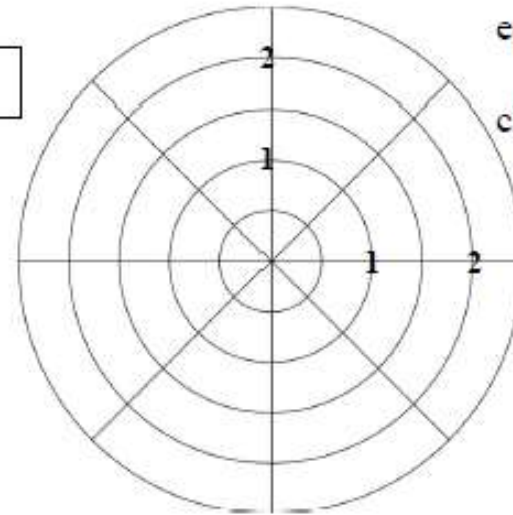
classification:



42

equation:

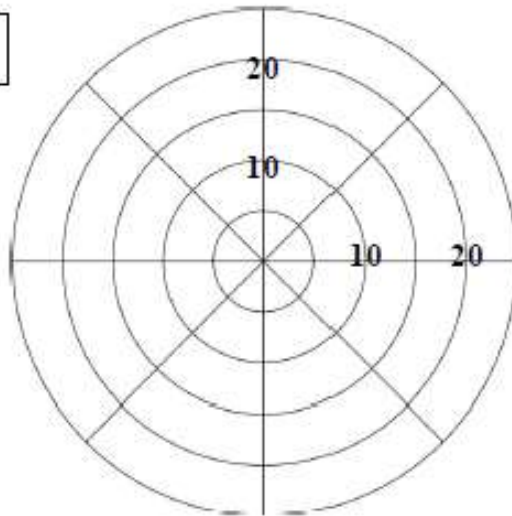
classification:



43

equation:

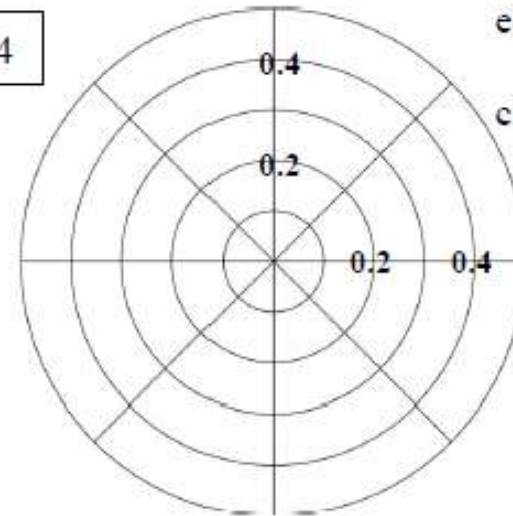
classification:



44

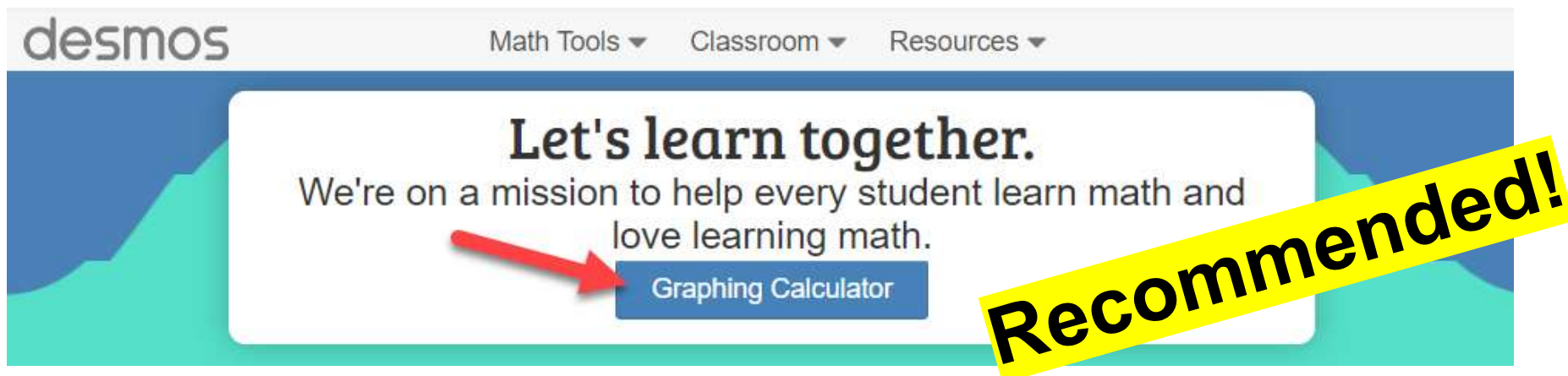
equation:

classification:

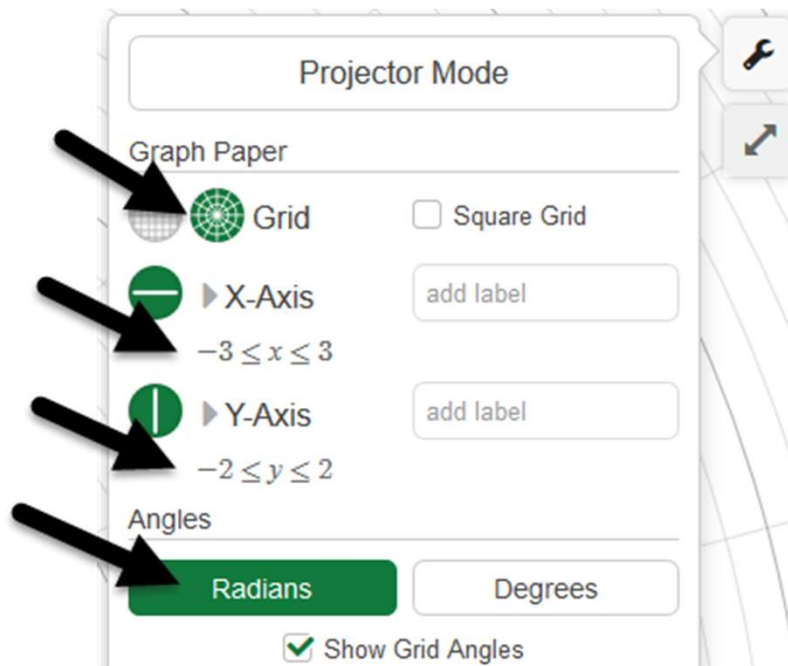
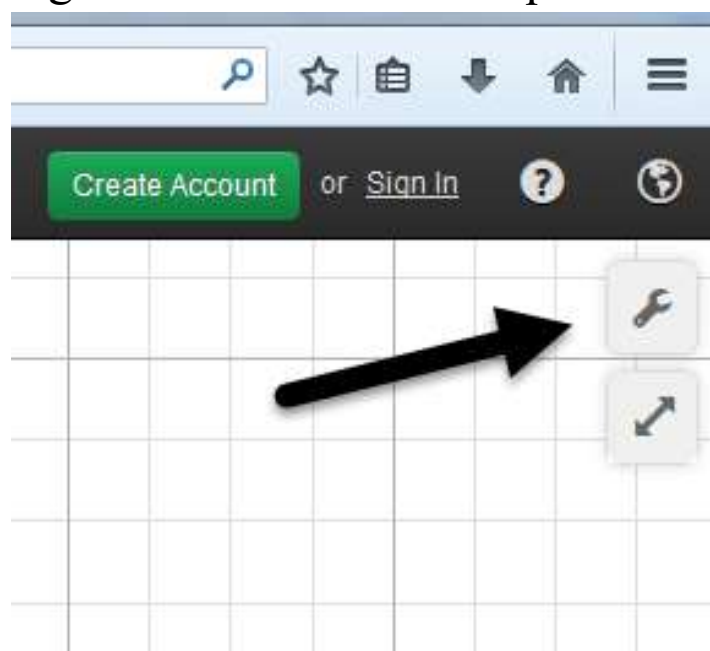


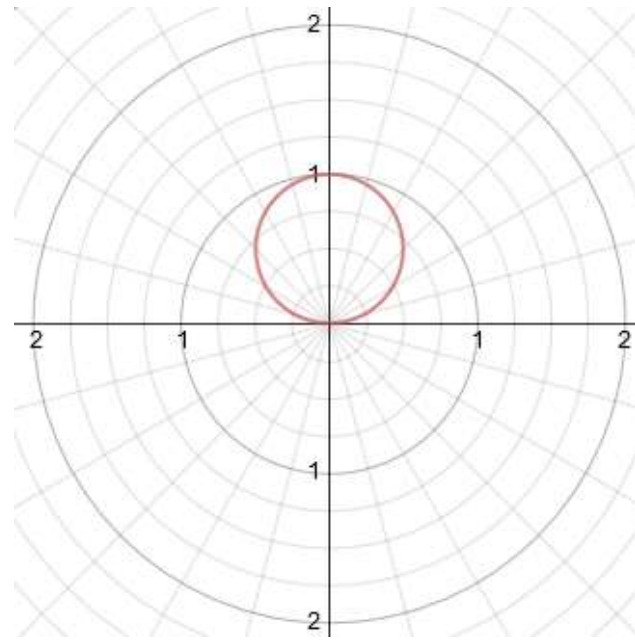
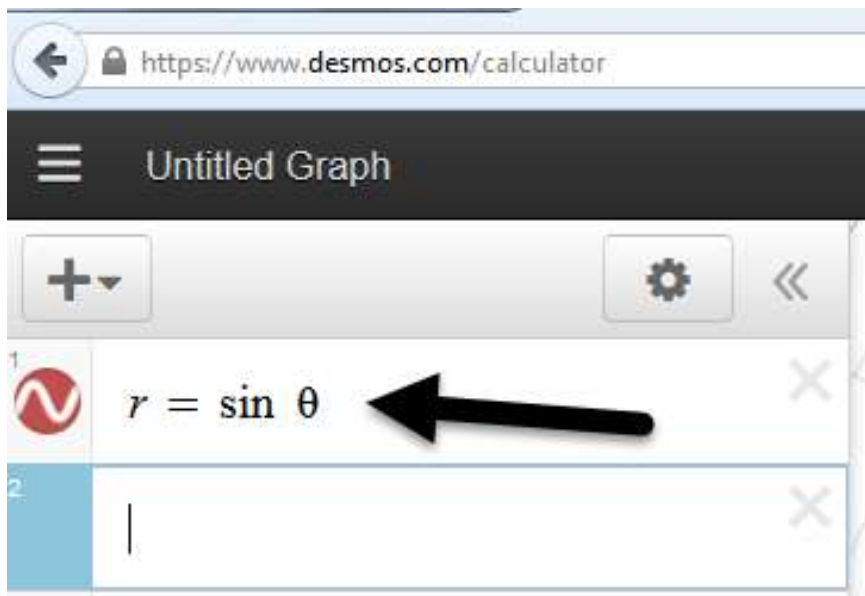
Use given increments to draw complete graphs that are fairly accurate. Plot key points on horizontal & vertical axes.

Go to desmos.com and click on Graphing Calculator:

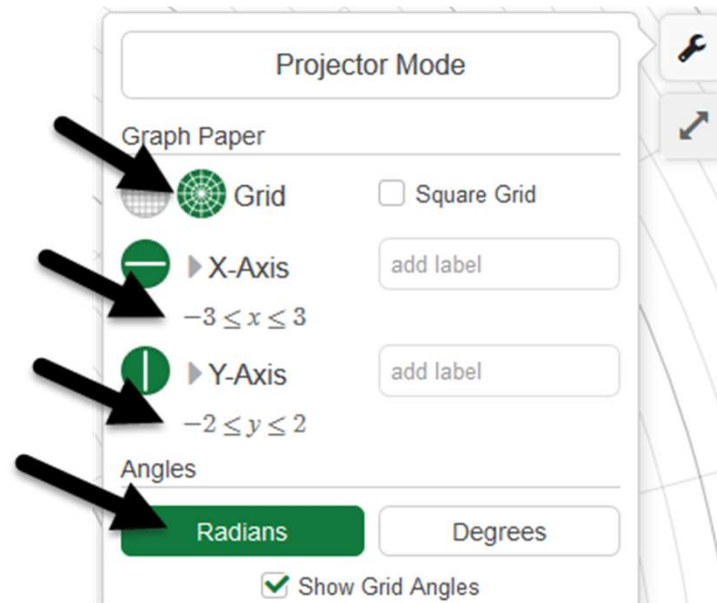


Click on **tool icon** in upper right corner, then choose options for **Circular Grid** and **Radians**. Be sure to size your graph window by adjusting the x-axis and y-axis to a ratio of 3:2 and/or adjust the viewing window to make it “square” so graphs aren’t distorted. You can also zoom in and out.





You are ready to type in your equations! To get the Theta symbol, you must type in $r = \text{theta}$ and the calculator will automatically switch it to $r = \theta$ for you.



TI-83+ and TI-84+ calculators:

- *Set **Mode** to *Pol* (polar graphing)
- *Select *Radians*
- *Create “square” window by using a **3:2 ratio** for x and y (so graphs aren't distorted)
- * Adjust window as needed and/or select **ZOOM**, option **ZoomFit**

Spiral will need multiple rotations so
ADJUST θ MAXIMUM to 6π or higher.

***Window for all graphs except for a spiral:**

θ min 0	X min -3	Y min -2
max 2π	max 3	max 2
step $\pi/24$	scale 1	scale 1

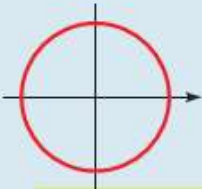
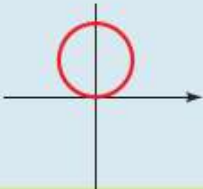
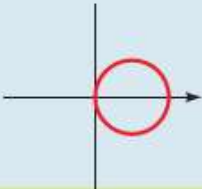
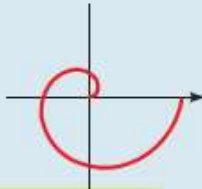
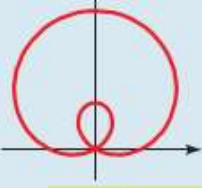
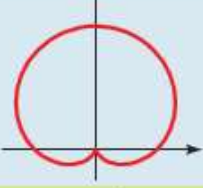
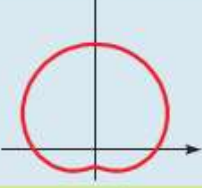
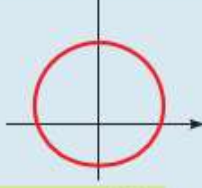
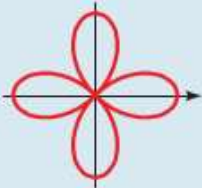
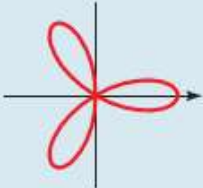
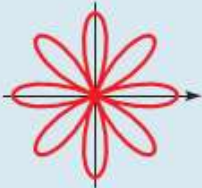
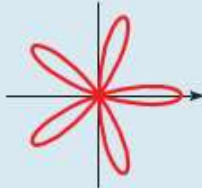
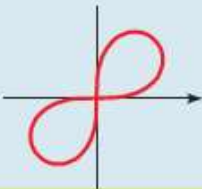
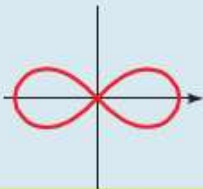
$\approx .1308996$

OR any 3:2 ratio $x = 3, 6, 9, 12, \dots$
 $y = 2, 4, 6, 8, \dots$



**Desmos is a bit easier to
navigate for polar graphing.**

8.2 Classifying (chart given in ebook & WebAssign)

SOME COMMON POLAR CURVES				
Circles and Spiral				
				
$r = a$ circle	$r = a \sin \theta$ circle	$r = a \cos \theta$ circle	$r = a\theta$ spiral	
Limaçons and Cardioid				
$r = a \pm b \sin \theta$ $r = a \pm b \cos \theta$ $(a > 0, b > 0)$ Orientation depends on the trigonometric function (sine or cosine) and the sign of b .				
				
$a < b$ limaçon with inner loop	$a = b$ cardioid	$a > b$ dimpled limaçon	$a = 2b$ convex limaçon	
Roses				
$r = a \sin n\theta$ $r = a \cos n\theta$ n -leaved if n is odd $2n$ -leaved if n is even				
				
$r = a \cos 2\theta$ 4-leaved rose	$r = a \cos 3\theta$ 3-leaved rose	$r = a \cos 4\theta$ 8-leaved rose	$r = a \cos 5\theta$ 5-leaved rose	
Lemniscates				
Figure-eight-shaped curves				
				
$r^2 = a^2 \sin 2\theta$ lemniscate	$r^2 = a^2 \cos 2\theta$ lemniscate			

8.2 #17-20, 24-34even, 40-44

CHECK EVEN ANSWERS

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

$$x^2 + y^2 = 1$$

cardioid

cardioid

circle

lemniscate

limacon

rose

rose

rose

spiral

HINT: #20

Since $\theta = \frac{5\pi}{6}$, it follows that $\tan \frac{5\pi}{6} = -\frac{\sqrt{3}}{3}$

Therefore, $\tan \theta = -\frac{\sqrt{3}}{3}$

Now substitute $\frac{y}{x}$ for $\tan \theta$,

then rewrite in $y = mx + b$ form