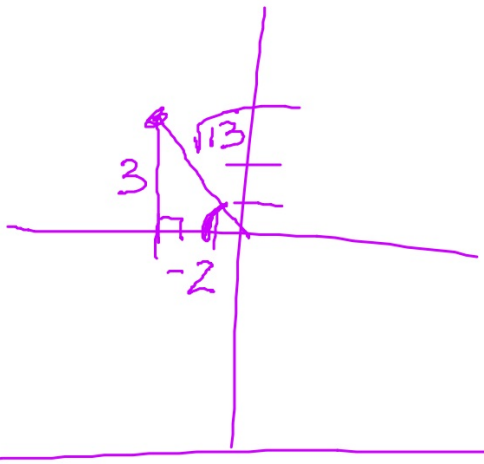
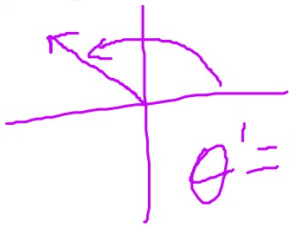
$(-2, 3)$



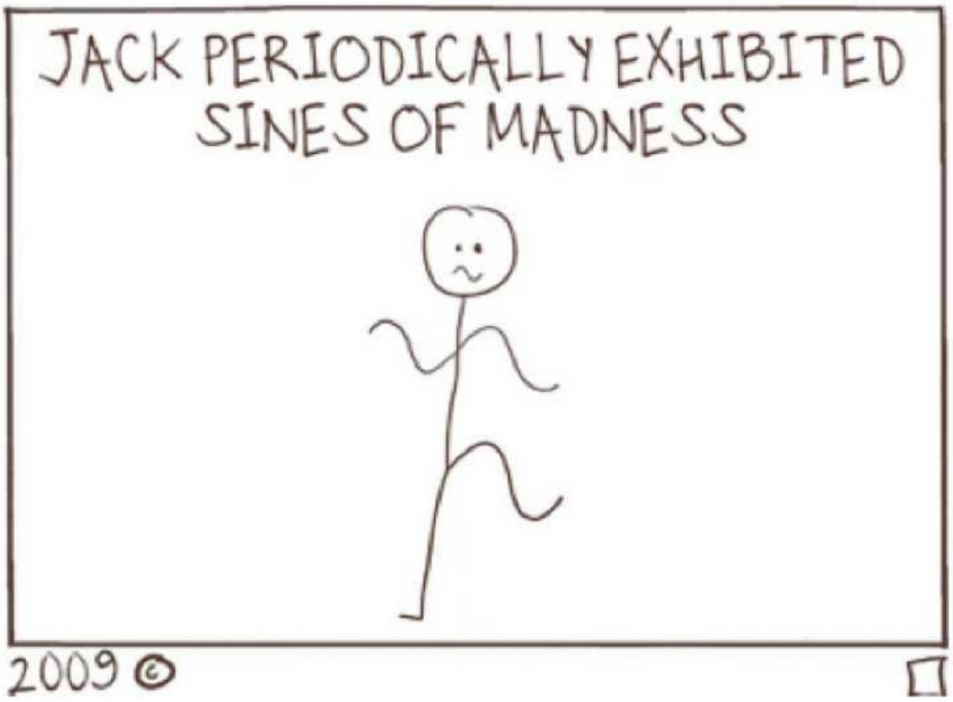
$$\tan\theta = -\frac{3}{2}$$

$$\sec 135^\circ = -\frac{1}{x} = \frac{-1}{\frac{\sqrt{2}}{2}} = -\sqrt{2}$$



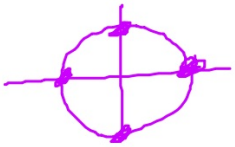
$\theta' = 45^\circ$

10.1/10.2 Sine and Cosine Curves



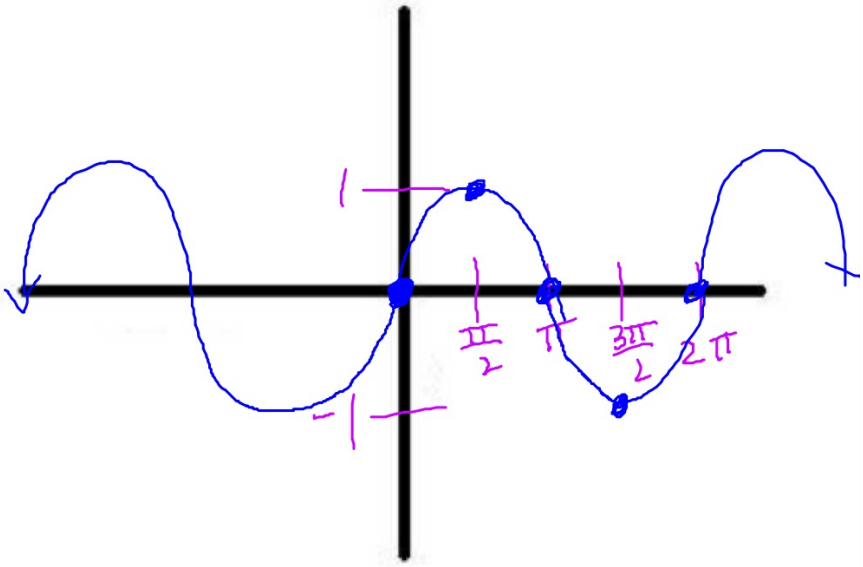
*See printout.

Parent Function: Sine



$$y = \sin x$$

x	y
0	0
$\frac{\pi}{2}$	1
π	0
$\frac{3\pi}{2}$	-1
2π	0



Parent Function: Sine

Domain: $(-\infty, \infty)$

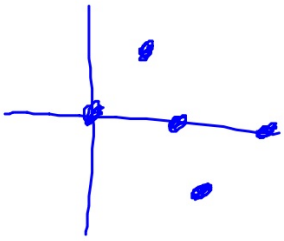
Range: $[-1, 1]$

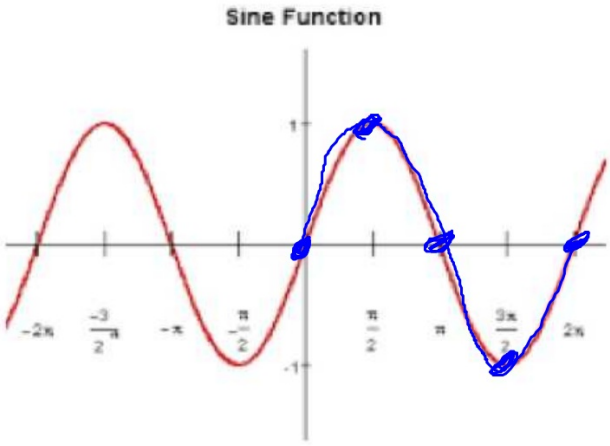
Symmetry: origin

Even/Odd/Neither:

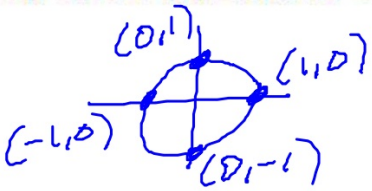
Period: 2π

Pattern:



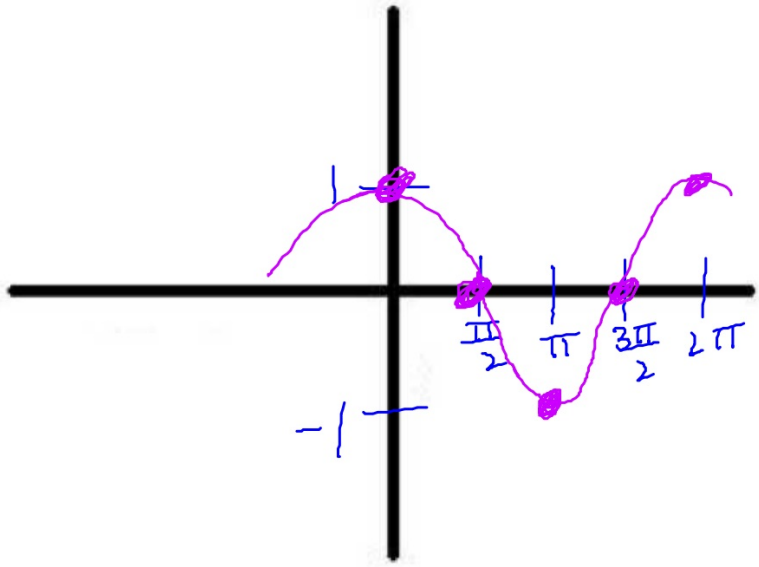


Parent Function: Cosine



$$y = \cos x$$

x	y
0	1
$\frac{\pi}{2}$	0
π	-1
$\frac{3\pi}{2}$	0
2π	1



Parent Function: ~~Coine~~ Cosine

Domain: $(-\infty, \infty)$

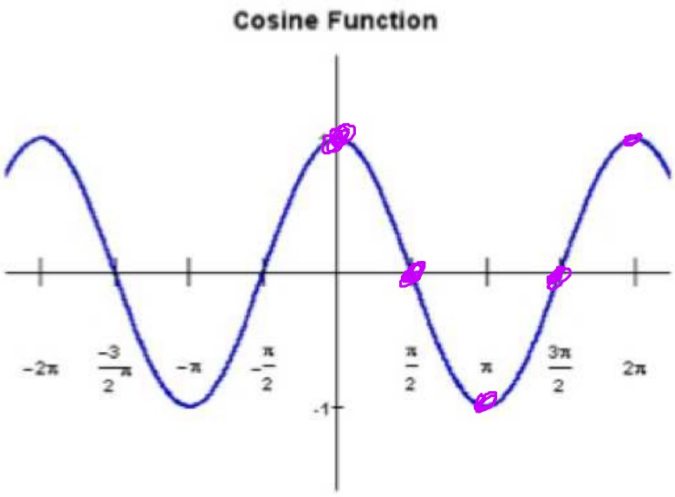
Range: $[-1, 1]$

Symmetry: y-axis

Even/Odd/Neither:

Period: 2π

Pattern:



Transformations

$$y = a\sin(bx - c) + d$$

$$y = a\cos(bx - c) + d$$

*To sketch you must find 7 key elements:

1. Amplitude - the distance from the midline to the maximum or minimum

$$A = |a|$$

2. Midline (axis):

$$y = d$$

3. Phase Shift (horizontal shift):

(PS) Set $bx - c = 0$

Transformations

$$y = a\sin(bx - c) + d$$

$$y = a\cos(bx - c) + d$$

4. Period - the horizontal length of one cycle

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

5. Increment: the horizontal length between 5 key x-values

$$I = \frac{P}{4}$$

6. 5 key x-values

7. Pattern

ex: Sketch then state the domain and range in any notation.

a) $y = 4\sin(x) - 2$

$A = 4$

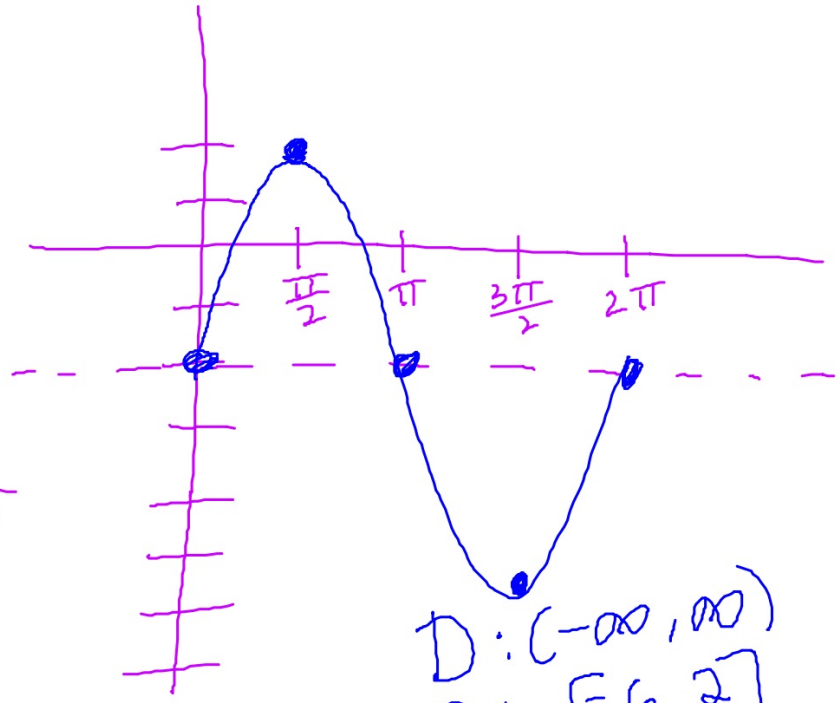
midline: $y = -2$

P.S. $x = 0$

none

period $= \frac{2\pi}{1} = 2\pi$

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



D: $(-\infty, \infty)$

R: $[-6, 2]$

ex: Sketch then state the domain and range in any notation.

b) $y = 3\cos 2x$

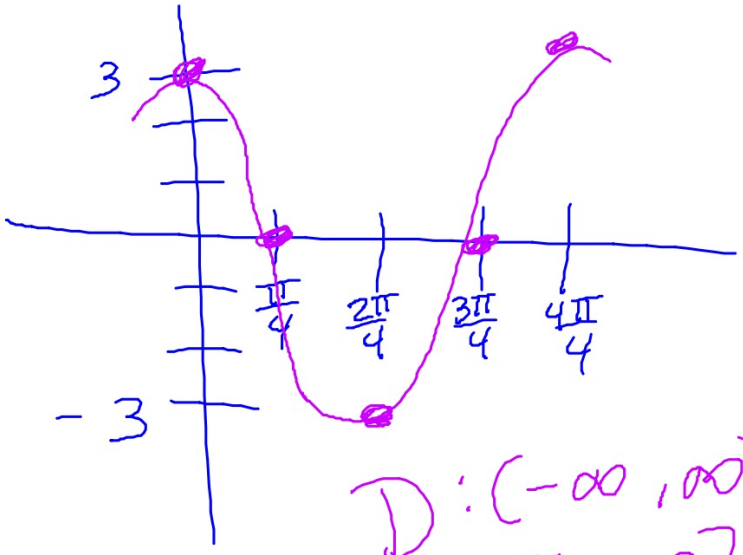
$A = 3$

mid: $y = 0$

PS: none

$P = \frac{2\pi}{2} = \pi$

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



D: $(-\infty, \infty)$

R: $[-3, 3]$

ex: Sketch then state the domain and range in any notation.

c) $y = 4\cos\left(5x - \frac{\pi}{3}\right) + 1$

$A = 4$

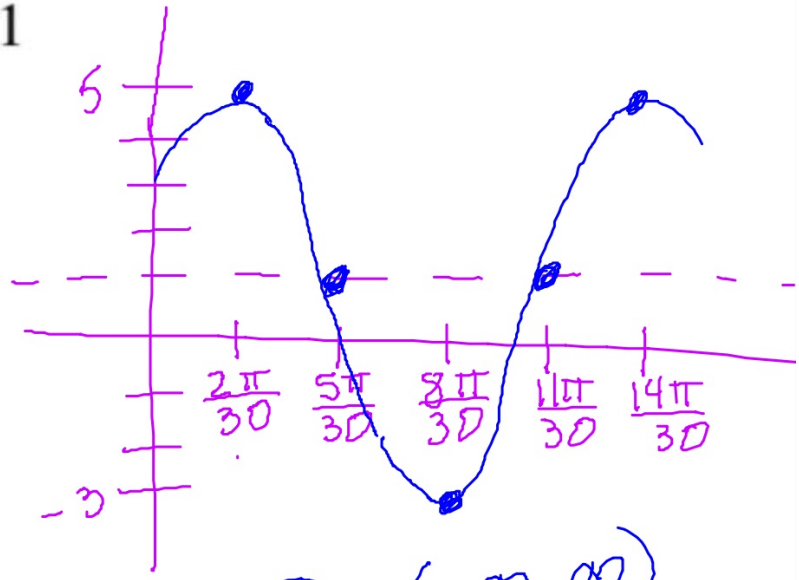
mid: $y = 1$

PS: $5x - \frac{\pi}{3} = 0$

$x = \frac{\pi}{15}$

$P = \frac{2\pi}{5}$

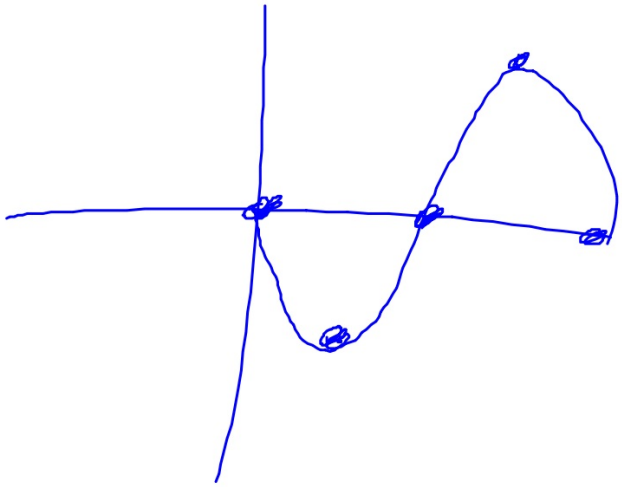
$T = \frac{\frac{2\pi}{5}}{4} = \frac{\pi}{10} \cdot \frac{3}{3} = \frac{3\pi}{30}$



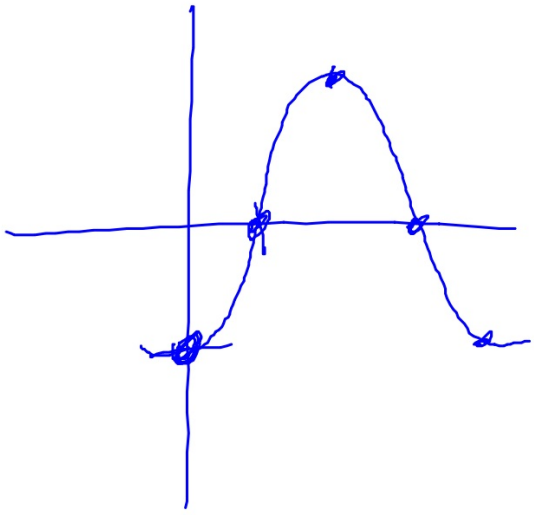
D: $(-\infty, \infty)$

R: $[-3, 5]$

$-\sin x$

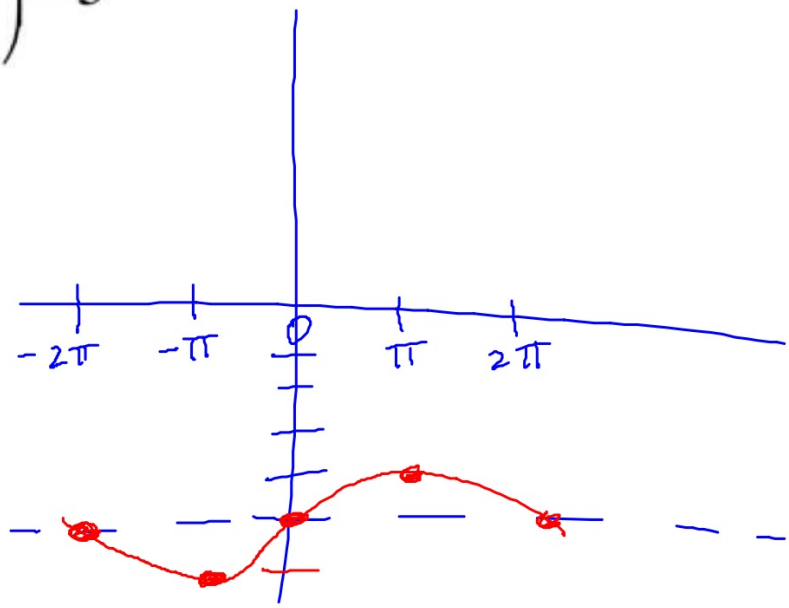


$-\cos x$



ex: Sketch then state the domain and range in any notation.

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



D: $(-\infty, \infty)$

R: $[-6, -4]$

ex: Sketch then state the domain and range in any notation.

e) $y = 2 - \cos\left(3x + \frac{\pi}{8}\right) = -\cos\left(3x + \frac{\pi}{8}\right) + 2$

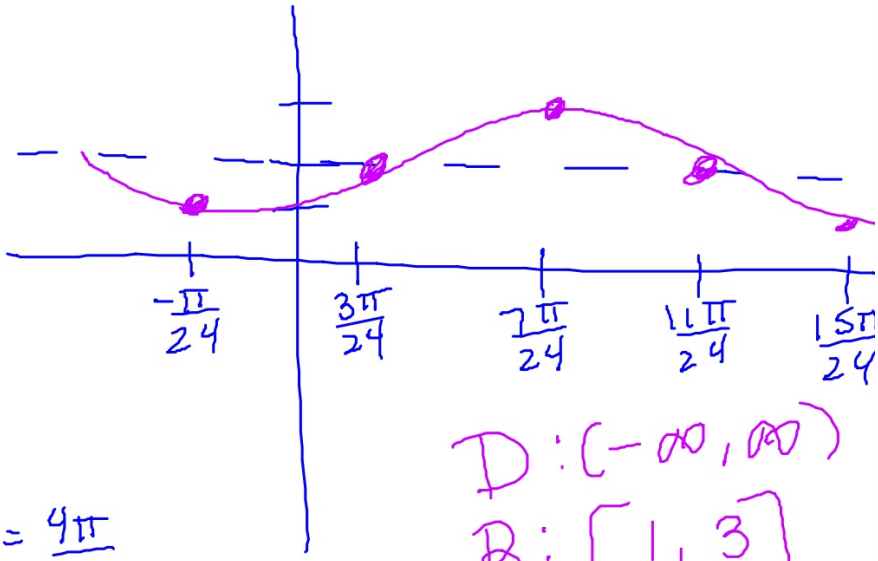
$A = 1$

mid: $y = 2$

$PS = -\frac{\pi}{24}$

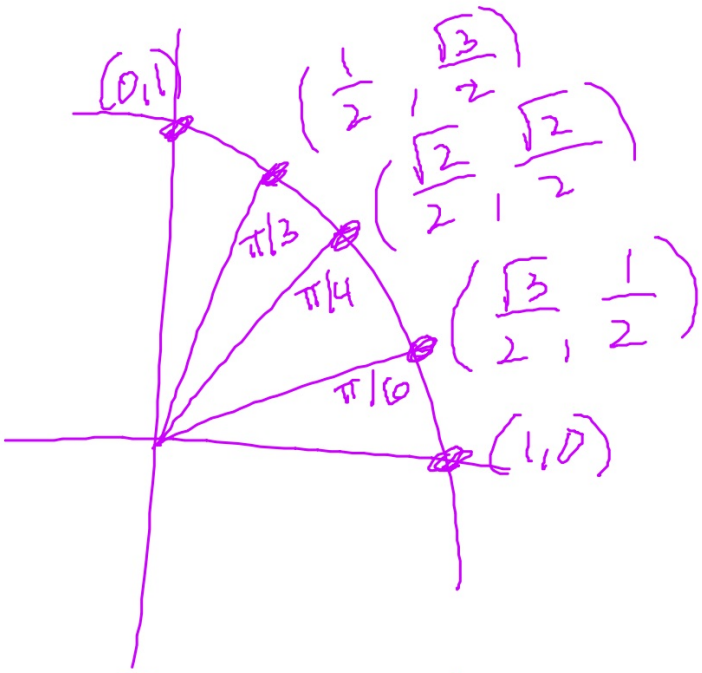
$P = \frac{2\pi}{3}$

$I = \frac{\frac{2\pi}{3}}{4} = \frac{\pi}{6} \cdot \frac{4}{4} = \frac{4\pi}{24}$



D: $(-\infty, \infty)$

R: $[1, 3]$

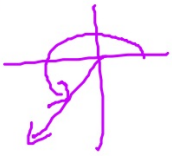


(1) $\cos\frac{2\pi}{3} = -\frac{1}{2}$

$\theta' = \frac{\pi}{3}$

(13) $\sec\frac{7\pi}{6} = -\frac{1}{\frac{\sqrt{3}}{2}}$

π



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

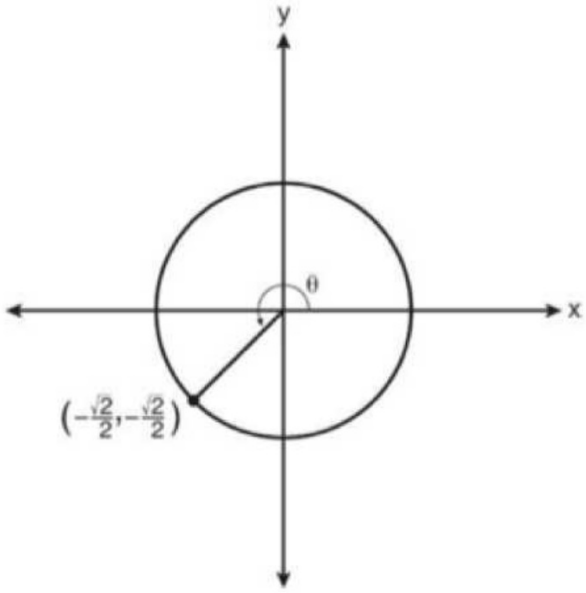
$-\frac{2\sqrt{3}}{3}$

(11) $\cot\frac{2\pi}{3} = -\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{\sqrt{3}}{3}$

$\theta' = \frac{\pi}{3}$

EOC REVIEW

1.



What is m$\angle\theta$?

1) 45
2) 135
3) 225
4) 240

EOC REVIEW

2. What is the formula for the nth term of the sequence $54, 18, 6, \ldots$?

1) $a_n = 6\left(\frac{1}{3}\right)^n$

2) $a_n = 6\left(\frac{1}{3}\right)^{n-1}$

3) $a_n = 54\left(\frac{1}{3}\right)^n$

4) $a_n = 54\left(\frac{1}{3}\right)^{n-1}$

EOC REVIEW

3. The expression $2i^2 + 3i^3$ is equivalent to
   1) $-2 - 3i$
   2) $2 - 3i$
   3) $-2 + 3i$
   4) $2 + 3i$

EOC REVIEW

4. The solution set of the equation $\sqrt{x+3} = 3 - x$ is