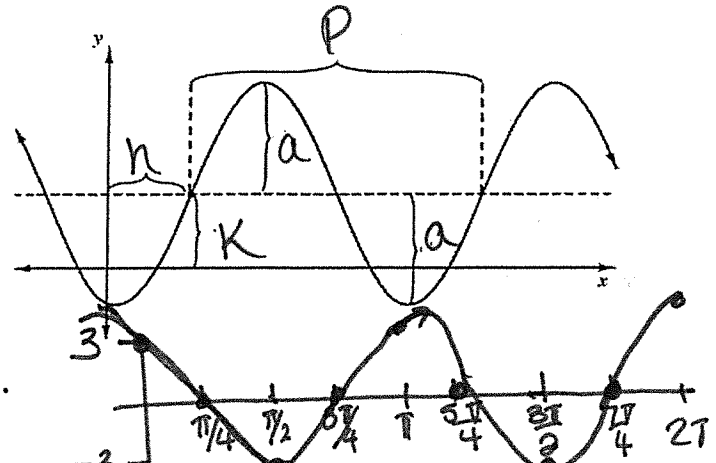
Graphing Trig Functions: F.TF.4 and F.IF.7e

1. Label each part of the graph with the appropriate term or letter.



b.

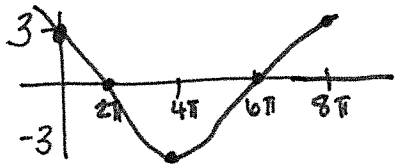
a = amplitude
h = horizontal shift
K = vertical shift
P = period

2. Graph 2 cycles of the following equations. Identify the amplitude, period. Equation for the midline and the number of cycles from 0 to 2π.

a. Y = 3cos (x/4) b. 3cos(2x)

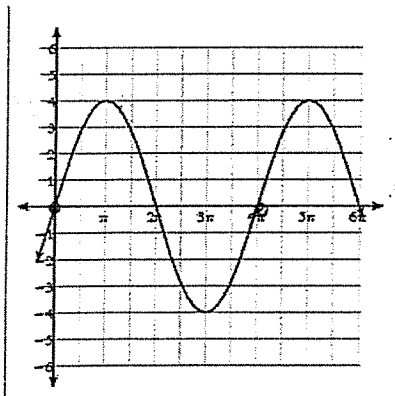
c. $y = \frac{1}{2}\cos 2x + 1$ d. y = 4 sin 2x + 3

a.

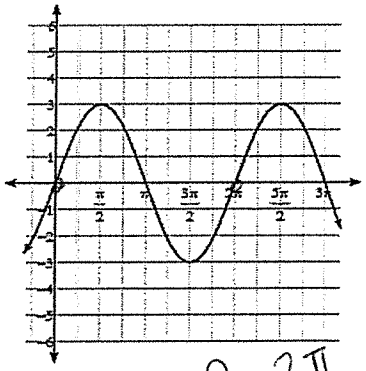


See attached sheet (1)

3. Identify the midline, amplitude, number of cycles and period then write the equation for each graph below.

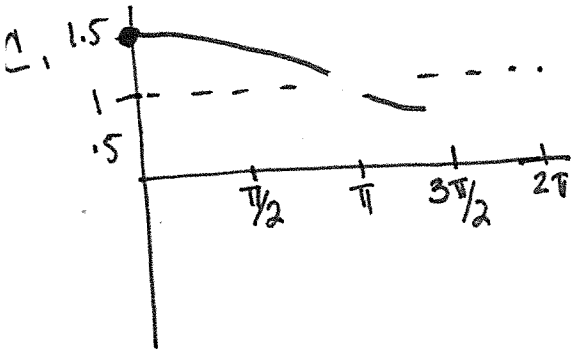


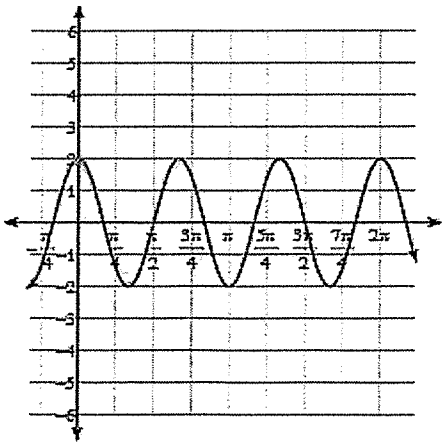
P = 4π
A = 4
M = 0
y = 4 sin 1/2x



P. 2π
A = 3
M = 0
y = 3 sin x

b.





y = 2cos 3θ

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

Solving Trig Functions: F.TF.4 and F.TF.6

I can apply the unit circle, exact values and inverses to solve trig functions.

1. Solve each of the equations over the given domains.

a. $\cos(x) = -\frac{\sqrt{2}}{2}$ for all x

a. $3\pi/4 + 2\pi n$
$5\pi/4 + 2\pi n$

b. $2\cos(x) = 1$ for all x

b. $x = \pi/3 + 2\pi n$
$x = 5\pi/3 + 2\pi n$

c. $\sin(x) + 1 = 0$ for $0 \le x < 2\pi$

c. $x = 3\pi/2$

d. $2\sin(x) - \sqrt{3} = 0$ for $0 \le x < 2\pi$

d. $\pi/3, 2\pi/3$

Solve the following equations. Your answer should be an exact value.

Solve each equation for $0 \le \theta < 2\pi$.

1) $-2\cos\theta = 1$

$2\pi/3, 4\pi/3$

2) $2\sin\theta = 1$

$\pi/6, 5\pi/6$

3) $-3\sqrt{3} = -6\sin\theta$

$\pi/3, 2\pi/3$

4) $-2 + \sin\theta = \frac{-6+2\sqrt{3}}{3}$

No Solution

Solve each equation for $0 \le \theta \le \pi$.

5) $3\sqrt{2} = 6\sin\theta$

$\frac{3\sqrt{2}}{6} = \frac{6\sin\theta}{6}$

$\frac{\sqrt{2}}{2} = \sin\theta$

$\pi/4, 3\pi/4$

6) $-5 + \cos\theta = -4$

0

7) $-3\sqrt{2} = -6\cos\theta$

$\pi/4$

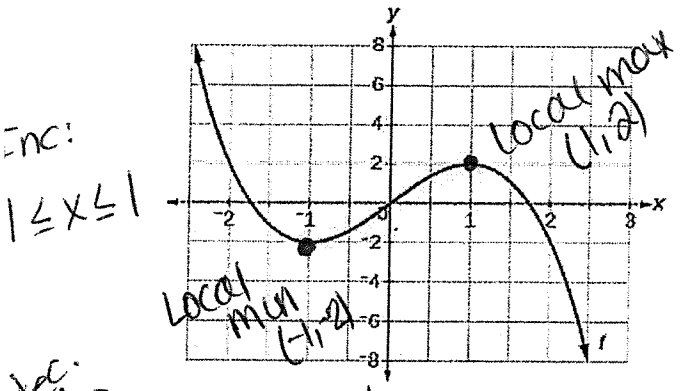
8) $\frac{\sqrt{2}}{4} = -\frac{1}{2}\cdot\cos\theta$

$3\pi/4$

Characteristcis of Functions F.IF.4

I can interpret. Describe and graph key features (including dectreasing, increasing intervals and minima and maxima points) of a given function.

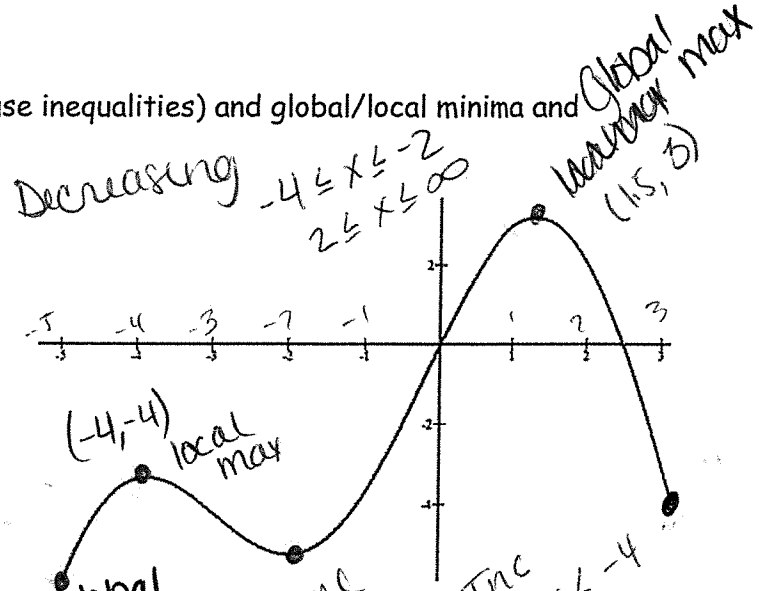
1. Identify the increasing and decreasing intervals (use inequalities) and global/local minima and maxima.



Inc: $-1 \le x \le 1$

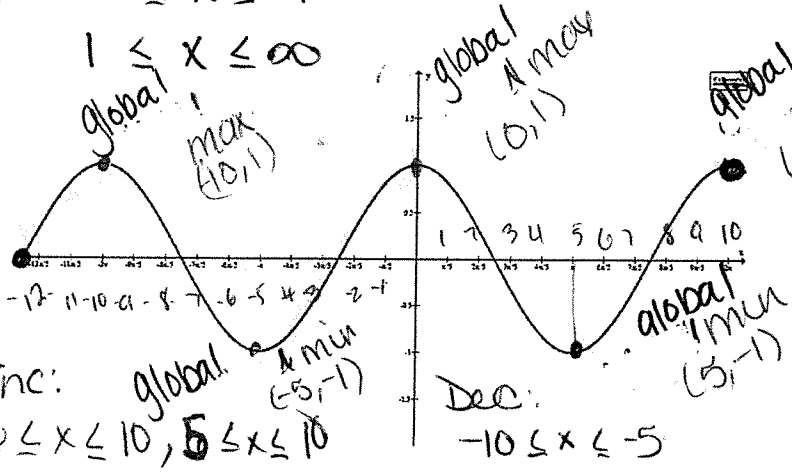
Dec: $-\infty \le x \le -1$

$1 \le x \le \infty$



Inc: $-5 \le x \le -4$

$-2 \le x \le 1$

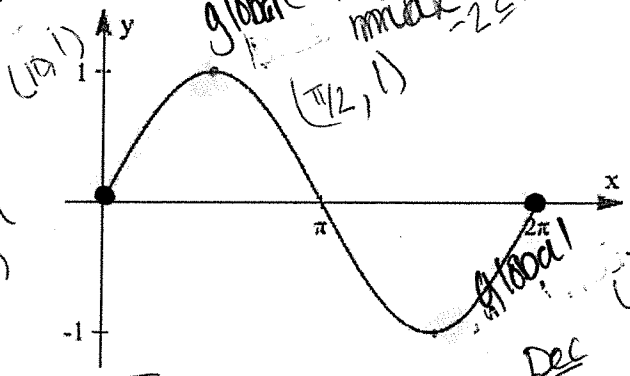


Inc: $-12 \le x \le 10$, $5 \le x \le 10$

$-5 \le x \le 0$

Dec: $-10 \le x \le -5$

$0 \le x \le 5$



Inc: $0 \le x \le \pi/2$

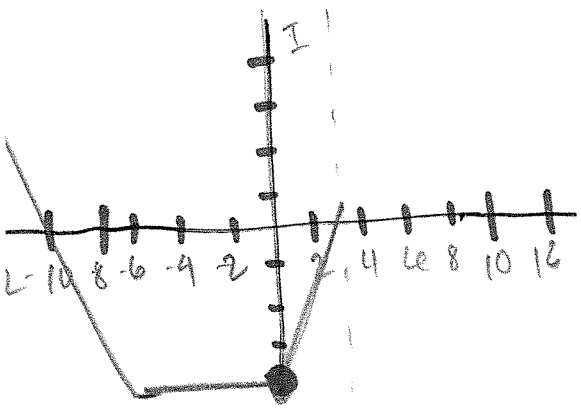
$3\pi/2 \le x \le 2\pi$

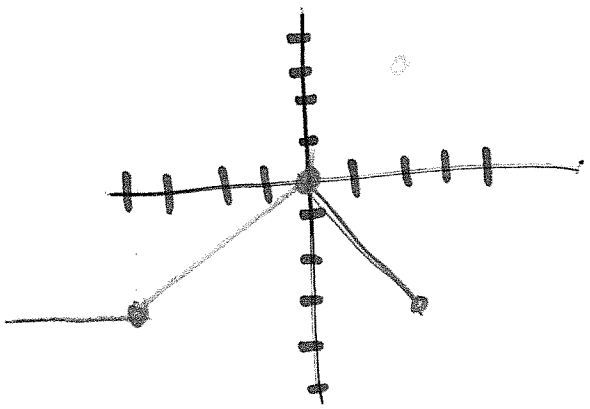
Dec $\pi/2 \le x \le 3\pi/2$

2. Sketch a graph the meets the given criteria.

a. Has a y-intecept of -4, is increasing only on the interval $0 \le x \le 3$, is constant over the interval $-6 \le x \le 0$ and is decreasing from $-\infty \le x \le -6$.

b. Includes the points (0,0),(-4,-3) and (2,-3) and is constant only on the interval $-\infty \le x \le -4$.





The Trig Basics F.TF.3 and F.TF.4

I can identify reference angles, conterminal angles and apply them to fond exact values of trig functions.

1. What is the reference angle for: to help us find the info for the whole unit circle

a. $\theta = \frac{15\pi}{6} = \frac{5\pi}{2}$ b. $\theta = -\frac{4\pi}{3}$ c. $\theta = -\frac{\pi}{3}$ d. $\theta = \frac{9\pi}{4}$

$\pi/2$ $\pi/3$ $\pi/3$ $\pi/4$

2. Determine the angle between 0 and 2π that is coterminal with the given angle. Sketch each angle in the unit circle. Identify the coordinate points for each.

a. $\theta = \frac{15\pi}{6}$ b. $\theta = -\frac{4\pi}{3}$ c. $\theta = -\frac{\pi}{3} + \frac{6\pi}{3}$ d. $\theta = \frac{9\pi}{4} - \frac{8\pi}{4}$

$\frac{15\pi}{6} - \frac{12\pi}{6} = \frac{3\pi}{6} = \pi/2$ $-\frac{4\pi}{3} + \frac{6\pi}{3} = \frac{2\pi}{3}$

3. Determine the exact value of the given trigonometric expression.

a. $\cos\frac{11\pi}{6}$ $\frac{\sqrt{3}}{2}$ b. $\sin\frac{5\pi}{4}$ $-\frac{\sqrt{2}}{2}$ c. $\cos -\frac{5\pi}{6}$ $-\frac{\sqrt{3}}{2}$

d. $\tan 0 = 0$ e. $\sin\frac{7\pi}{4}$ $-\sqrt{2}/2$ f. cos All what

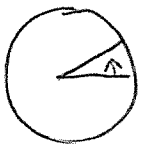
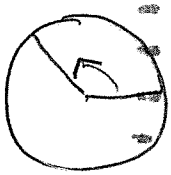
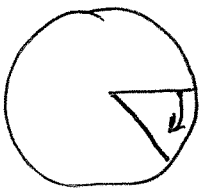
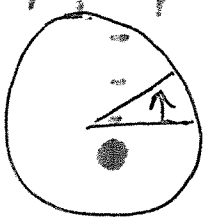
g. $\tan\frac{\pi}{6} = \frac{\sqrt{3}}{3}$ h. $\tan\frac{3\pi}{4}$ -1 i. $\cos\frac{5\pi}{6}$ $-\frac{\sqrt{3}}{2}$

$\frac{1/2}{\sqrt{3}/2} = \frac{1}{2} \div \frac{\sqrt{3}}{2} = \frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$

4. Sketch the following angles in a unit circle and find the value of tan (θ)

5. $\theta = \frac{\pi}{6}$ b. $\theta = -\frac{4\pi}{3}$ c. $\theta = -\frac{\pi}{3}$ $-\sqrt{3}$ d. $\theta = \frac{9\pi}{4}$ $= 1$

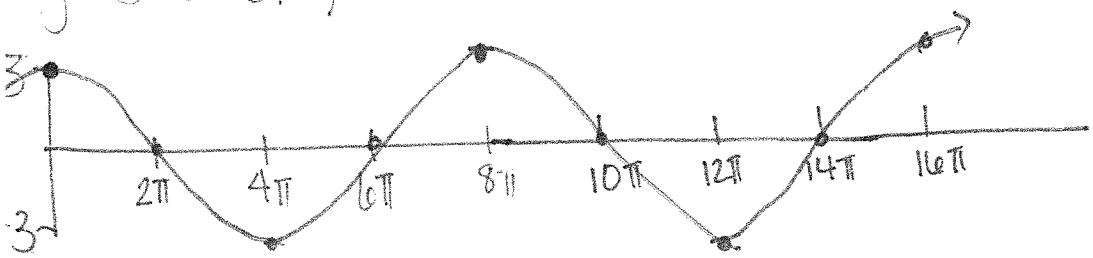
$\frac{\sqrt{3}}{3}$

#2

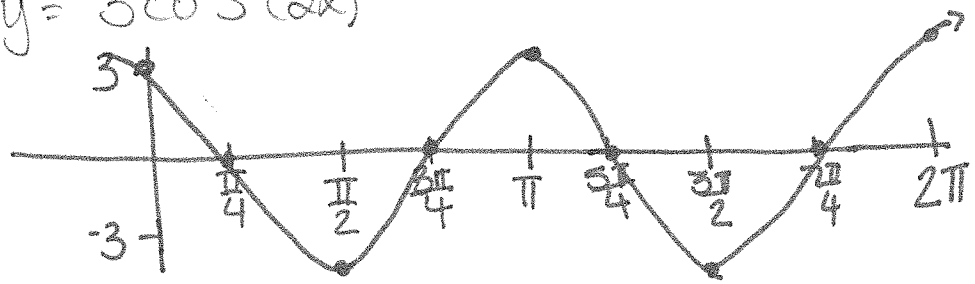
$P = \frac{2\pi}{1/4} = 8\pi$ $M = 0$

9. $y = 3\cos(x/4)$ $A = 3$

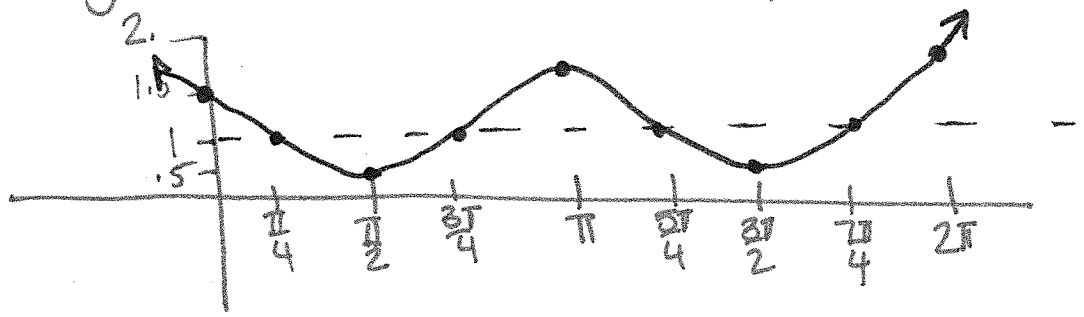


$P = 2\pi/2 = \pi$ $A: 3$ $M = 0$

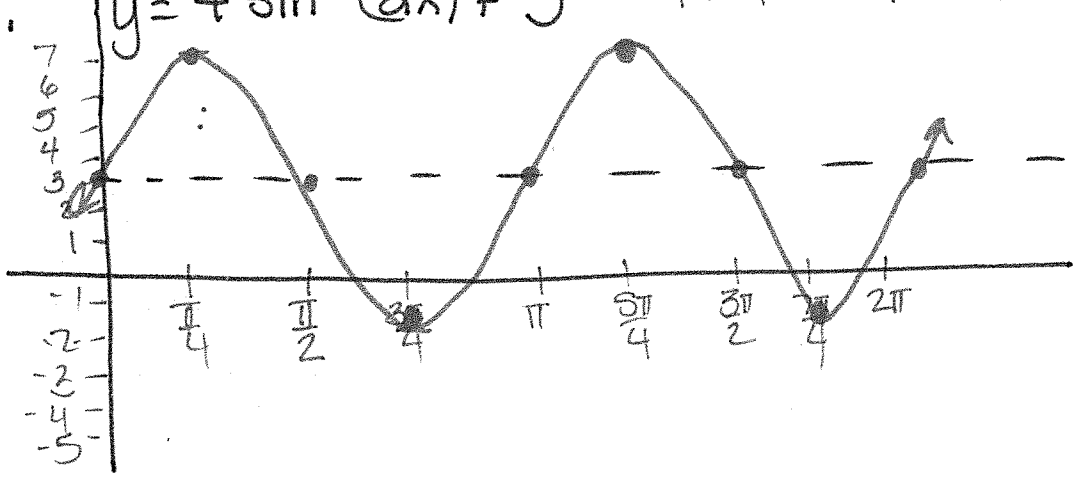
10. $y = 3\cos(2x)$



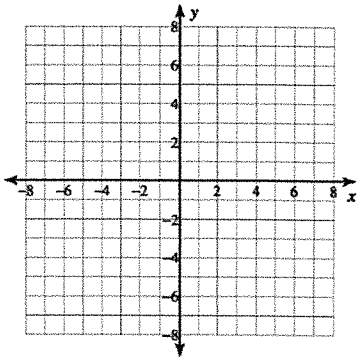
11. $y = 1/2\cos(2x) + 1$ P. $\frac{2\pi}{2} = \pi$ $A = 1/2$ $M = 1$



12. $y = 4\sin(2x) + 3$ P. π $A = 4$ $M = 3$

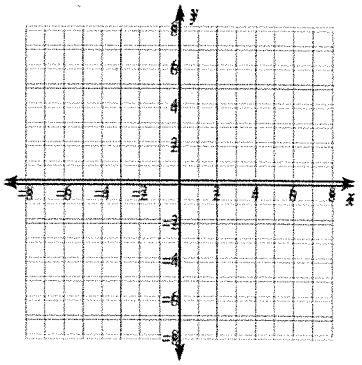


7. $12x + 8y < 24$



Check Points:
$(0, 3)$
$(-1, 0)$
$(-3, 4)$

8. $5x - 4y \geq 20$



Check Points:
$(6, -1)$
$(2, -4)$
$(-1, -2)$

$$-\frac{\sqrt{3}}{2} \div \frac{1}{2} = -\frac{\sqrt{3}}{2} \cdot \frac{2}{1} = -\sqrt{3}$$

$y/x =$