

Name: Key Date: _____ Period: _____ Score: _____

AA5 Team Test

1) Convert the following into radians or degrees. Reduce all fractions

a. $\frac{3\pi}{4} \cdot \frac{180}{\pi} = 135^\circ$

b. $\frac{5\pi}{4} = 225^\circ$

c. $20^\circ \cdot \frac{\pi}{180} = \frac{20\pi}{180} = \frac{\pi}{9}$

d. $\frac{19\pi}{12} = 285^\circ$

e. $220^\circ = \frac{11\pi}{9}$

f. $\frac{4\pi}{3} = 240^\circ$

g. $\frac{5\pi}{36} = 25^\circ$

h. $\frac{17\pi}{12} = 255^\circ$

2) Find the exact value for following measurements

a. $\sin 225^\circ = -\frac{\sqrt{2}}{2}$

b. $\cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$

c. $\sin 210^\circ = -\frac{1}{2}$

d. $\sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}$

e. $\cos \frac{11\pi}{6} = \frac{\sqrt{3}}{2}$

3) Examine the angles below.

- Convert them to an angle between 0 and 2π .
- Find their reference angle

$-\frac{\pi}{4} \cdot \frac{180}{\pi} = -45$

$-\frac{16\pi}{9} \cdot \frac{180}{\pi} = -320$

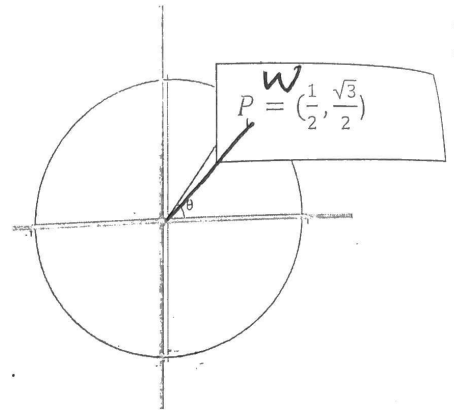
a. $360 + -45 = 315 \cdot \frac{\pi}{180} = \frac{7\pi}{4}$

a. $360 - 320 = 40^\circ$
 $\frac{40}{180} = \frac{2\pi}{9}$

b. $360 - 315 = 45^\circ \cdot \frac{\pi}{180} = \frac{\pi}{4}$

$= \frac{2\pi}{9}$

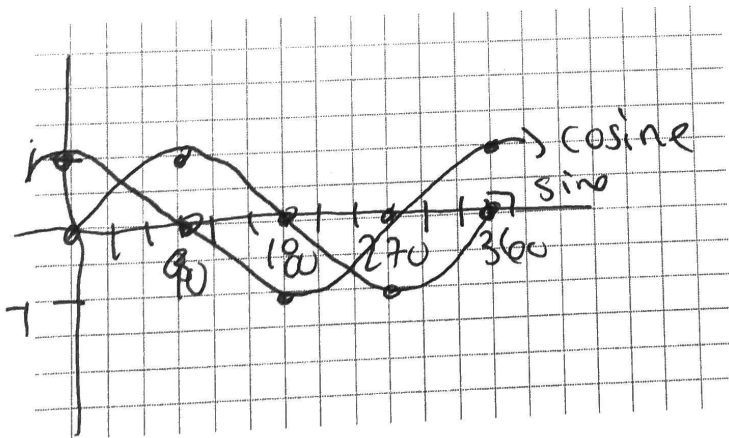
- 4) A unit circle has angle θ in standard position. Point P is on the circle and the coordinates of P are shown.



- a. Draw in the reference angle for θ and label it W. 60°
- b. What is $\cos\theta$? $1/2$
- c. What is $\sin\theta$? $\sqrt{3}/2$
- d. What is the measure of angle θ ? Give your answer in radians and degrees.

$$60^\circ, \pi/3$$

- 5) What are the differences between the graph of sine and cosine? Sketch an example of each below and write 3 sentences comparing and contrasting the two functions.



Sine starts at the midline and cosine at the max. Both are repeating

- 6) Find the midline, amplitude, and period of the functions given below.

a. $y = 4 \sin(2x) - 9$

$$a = 4, m = -9$$

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

b. $y = 3 + 8\cos(3\theta)$

$$a = 8$$

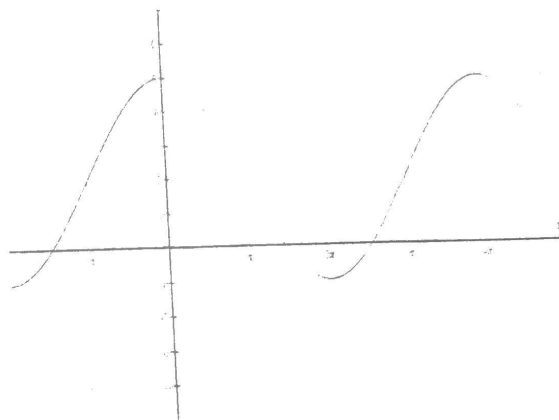
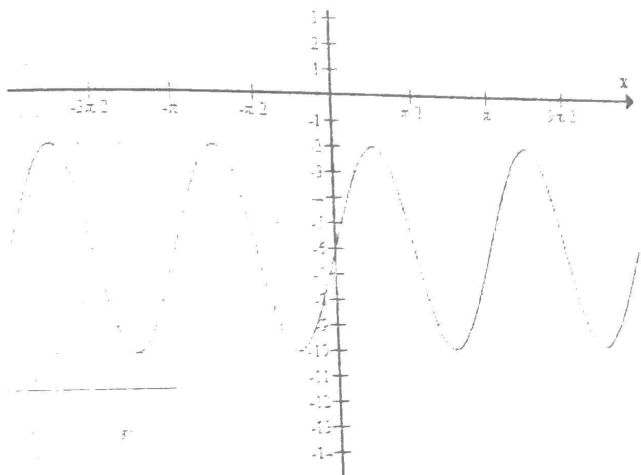
$$m = 3$$

$$p = \frac{360}{3} = 120^\circ$$

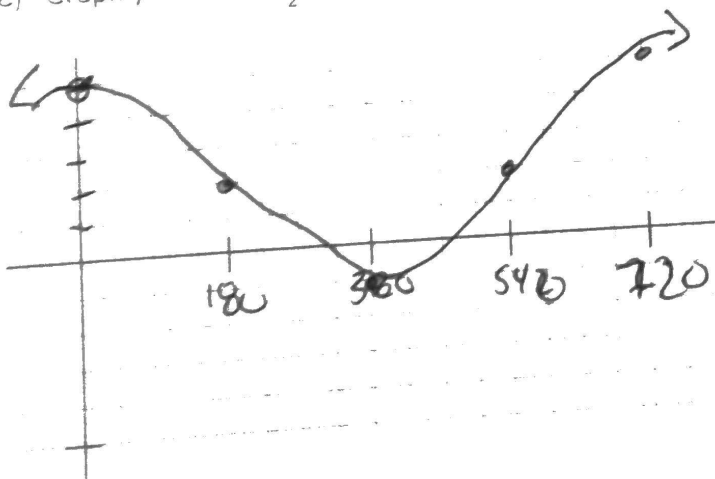
4. Write a reasonable equation for each graph. The units are in degrees.

a. Equation: $y = 4 \sin(2x) - 6$

b. Equation: $y = 3 \cos(\frac{1}{2}x) + 2$



8) Graph $y = 2 + 3 \cos(\frac{\theta}{2})$. Be sure to fill in the units on the x- and y-axes. The units are in radians.



x	y
0	5
180	2
360	-1
540	2
720	5

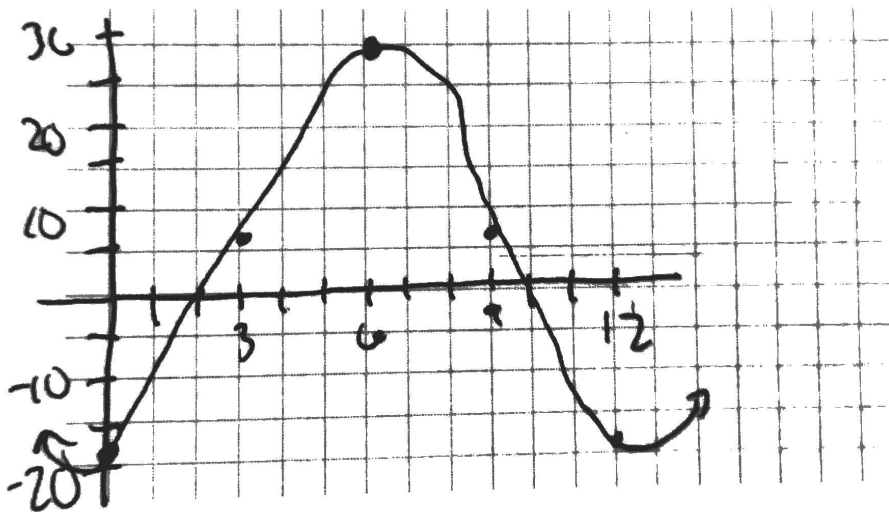
9) Suppose the average high temperature, each month, in Central Park (New York) is modeled by the equation $t(m) = -24\cos(30m) + 6$, starting in January.

a. Find the temperature in February (Hint: what should $m = ?$)

$$-24\cos(30 \cdot 1) + 6 = -14.8^\circ$$

b. What month will the temperature be the highest? What will that temperature be?

c. Sketch a graph of one complete cycle.



$$\frac{360}{30} = 12$$

X	Y
0	-18
3	6
6	30
9	6
12	-18

10. As you ride the Ferris wheel, your distance from the ground varies sinusoidally with time. You are filled and the ferris wheel starts immediately. Let t be the number of seconds that have elapsed since the wheel started. You find that it takes you 3s to reach the top, 43 ft. above the ground, and that the wheel makes one full rotation every 8s. The diameter of the wheel is 40 ft.

a. Sketch a graph.

