

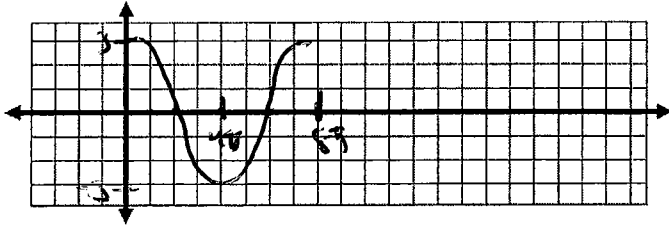
Chapter 13 Review

Name: Key Hour: _____

For problems #1 & 3, graph one complete cycle. For problems #2 & 4, graph from 0 to 2π . For problems #5 & 6, graph two complete cycles.

Then, state the period, the amplitude, and the range in the spaces provided.

1) $y = 3 \cos\left(\frac{\theta}{4}\right)$

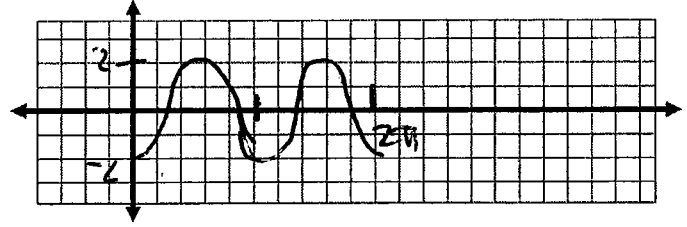


Period: 8π

Amplitude: 3

Range: $(-3, 3)$

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

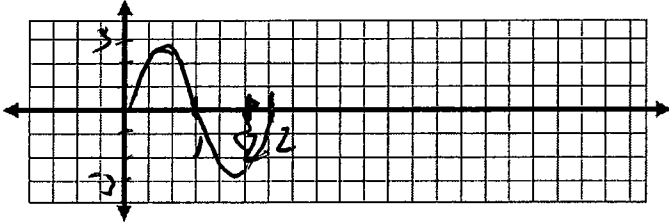


Period: π

Amplitude: 2

Range: $(-2, 2)$

3) $y = 3 \sin \pi\theta$

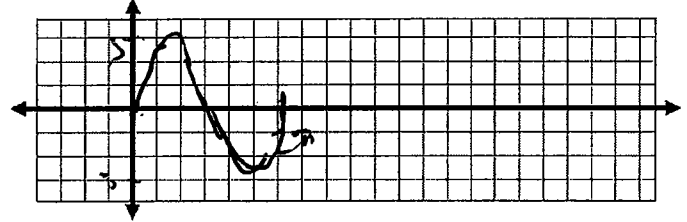


Period: 2

Amplitude: 3

Range: $(-3, 3)$

4) $y = 3 \sin(\theta)$

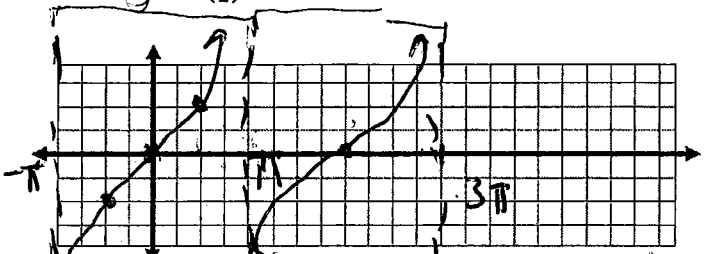


Period: 2π

Amplitude: 3

Range: $(-3, 3)$

5) $y = 2 \tan\left(\frac{\theta}{2}\right)$

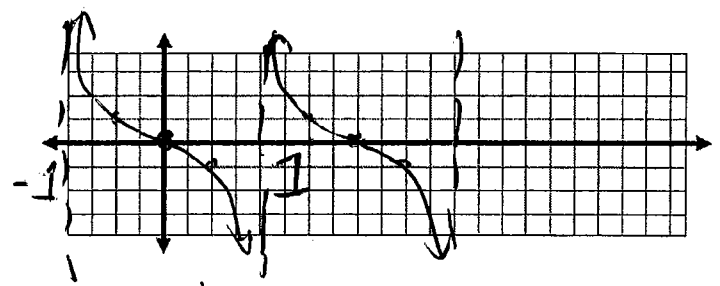


Period: 2π

Asym: $2\pi \times \frac{1}{2} = \pi$

Range: \mathbb{R}

6) $y = -\tan \pi\theta$



Period: 1

Range: \mathbb{R}

7) Write a cosine function that has amplitude of 3, a period of 6, and is reflected across the x-axis.

$$y = -3 \cos \frac{\pi}{3} \theta$$

$$b = \frac{2\pi}{b} \quad \frac{6b}{6} = \frac{2\pi}{6}$$

8) Write a sine function with amplitude of 5 and a period of $\frac{\pi}{2}$.

$$y = 5 \sin 4\theta$$

$$\frac{\pi}{2} = \frac{2\pi}{b} \quad \pi b = 4\pi$$

9) Which angle, in standard position, is NOT coterminal with the others?

a. -190°

b. 170°

c. 190°

d. 890°

10) Convert each angle measure in to its equivalent in radians or degrees.

a. -20°

$$-20 = \frac{\pi}{180}$$

b. $200^\circ = \frac{\pi}{180}$

$$\frac{10\pi}{9}$$

c. $\frac{-3\pi}{2}$ radians = $\frac{180}{\pi}$

$$= 3 \cdot 90$$

$$-270^\circ$$

d. $\frac{5\pi}{4}$ radians = $\frac{180}{4}$

$$225^\circ$$

11) Find the measure of an angle between 0° and 360° coterminal with each given angle.

a. -110°

$$250^\circ$$

b. 420°

$$60^\circ$$

c. -750°

$$330^\circ$$

12) Find the measure of an angle between 0 and 2π coterminal with each given angle.

a. $\frac{19\pi}{6}$

$$\frac{7\pi}{6}$$

b. -3π

$$\pi$$

c. $\frac{17\pi}{4}$

$$\frac{\pi}{4}$$

13) A gear with a radius of 2 in. turns through an angle of 300° . How far does a point on the edge of the gear travel as the gear turns through this angle?

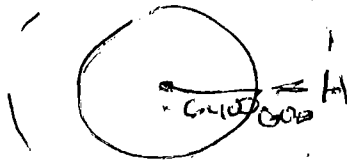
$$4\pi = \frac{300}{360}$$

$$2\pi r = \text{---}$$

$$4\pi = \frac{5}{6}$$

$$\frac{20\pi}{6} \text{ IN.}$$

- 1) A satellite completes one orbit around Earth every 10 hours. The satellite orbits 600 km above the Earth's surface. How far will the satellite travel in 4 hours, if the Earth's radius is 6400 km?



$$R = 7000$$

$$2\pi \cdot 7000 \cdot \frac{4}{10}$$

$$14000\pi \cdot \frac{4}{10}$$

$$5600\pi$$

- 15) True or False: Circle the correct answer for each statement. (Hint: Test with specific values)

a. True False

$$\sin(\theta) = \sin(-\theta)$$

$$\sin 45^\circ = \sin -45^\circ$$

b. True False

$$\cos(\theta) = -\cos(\theta)$$

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

c. True False

$$\tan(\theta) = \tan(\theta - \pi)$$

$$\tan 60^\circ = \tan(60^\circ - 180^\circ)$$

- 16) Find the exact value of each expression:

a. $\cos 120^\circ - \cos \frac{\pi}{3}$

$$-\frac{1}{2} - \frac{1}{2} = -1$$

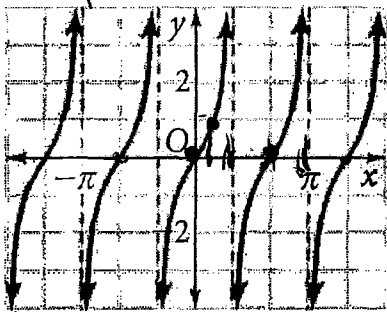
b. $1 - (\sin 240^\circ)^2$

$$1 - \left(-\frac{\sqrt{3}}{2}\right)^2 = 1 - \frac{3}{4}$$

$$1 - \frac{3}{4} = \frac{1}{4}$$

- 17) What are the period and amplitude of the each function? Write an equation for each graph.

a.



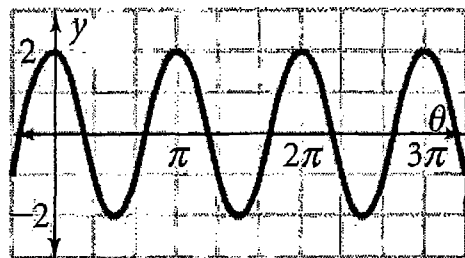
$$\frac{\pi}{b} = \frac{2\pi}{3}$$

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

Period: $\frac{2\pi}{3}$

Equation: $y = \frac{1}{2} \tan \frac{3}{2} x$

b.



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

$$b = 2$$

Period: π Amplitude: 2

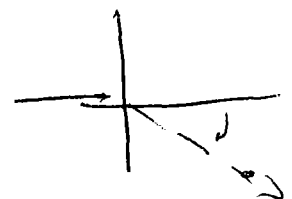
Equation: $y = 2 \cos 2x$

- 18) An angle drawn in standard position has a terminal side that passes through the point $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$.

What are TWO possible measures of the angle, in standard position?

$$-45^\circ$$

$$315^\circ$$



19) On your unit circle, label the indicated angles by their degree measure, radian measure, and coordinates. Then, use it to answer the following questions:

a. $\sin 450^\circ = 1$

d. $\sin -330^\circ = \frac{1}{2}$

g. $\sin \pi = 0$

j. $\sin \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$

b. $\cos -120^\circ = -\frac{1}{2}$

e. $\cos 90^\circ = 0$

h. $\cos \frac{2\pi}{3} = -\frac{1}{2}$

k. $\cos \frac{-11\pi}{3} = \frac{1}{2}$

c. $\tan 135^\circ = -1$

f. $\tan 360^\circ = 0$

i. $\tan \frac{\pi}{2} = \text{und.}$

l. $\tan \frac{2\pi}{3} = \sqrt{3}$

