

Unit 8 - Trigonometry

Review

Name: _____

Date: _____

Show all work to receive full credit. Give exact answers only.

_____ 1. A Ferris Wheel was placed in Downtown Raleigh for the upcoming Summer Sizzler Festival. The diameter of the wheel is 70 meters long and takes 2.5 minutes to make one rotation. If the central axel of the wheel is 45 meters off the ground, find an algebraic equation below that would appropriately model a car's height off the ground over time if the car starts at "3 o'clock" and is traveling counter clockwise.

- a) $-35\sin\frac{4\pi}{5}x + 45 = y$
- b) $35\sin\frac{4\pi}{5}x + 45 = y$
- c) $35\sin\frac{4\pi}{5}x + 10 = y$
- d) $35\sin(2.5x) + 45 = y$

_____ 2. Using the above information, which of the following equations could *also* model the car's height off the ground versus time?

- a) $y = -35\cos(144x - 90) + 45$
- b) $y = 35\cos(144x - 90) + 45$
- c) $y = -35\cos(144x - 90) + 80$
- d) $y = 35\cos(144x - 90) + 80$

_____ 3. Find the exact value for $\sin 660^\circ$

- a) $-\frac{1}{2}$
- b) $\frac{1}{2}$
- c) $\frac{\sqrt{3}}{2}$
- d) $\frac{-\sqrt{3}}{2}$

_____ 4. Find the exact value for $\cos -\frac{5\pi}{4}$

- a) $-\frac{1}{\sqrt{2}}$
- b) $\frac{1}{\sqrt{2}}$
- c) $\frac{\sqrt{3}}{2}$
- d) $\frac{-\sqrt{3}}{2}$

_____ 5. Find $\tan \theta$ if the terminal side goes through the point $(-4, 7)$.

- a) $-\frac{7}{4}$
- b) $-\frac{4}{7}$
- c) $-\frac{7}{\sqrt{65}}$
- d) $-\frac{4}{\sqrt{65}}$

_____ 6. The $\sin \theta = \frac{8}{9}$ and lies in the 4th quadrant. Find the $\cos \theta$.

- a) $\theta = \frac{\sqrt{17}}{8}$
- b) $\theta = \frac{9}{8}$
- c) $\theta = \frac{9}{\sqrt{17}}$
- d) $\theta = \frac{\sqrt{17}}{9}$

_____ 11. Find the amplitude of $y = 7 + 6 \sin 2x$

- a) 7
- b) 6
- c) π
- d) 2

_____ 12. Find the period length of $y = -6 \cos(2x + \pi) - 2$

- a) -6
- b) 2
- c) 2π
- d) π

_____ 13. Find the phase shift of $y = 9 \sin\left(\frac{1}{4}x - \frac{3\pi}{4}\right) + \frac{\pi}{3}$

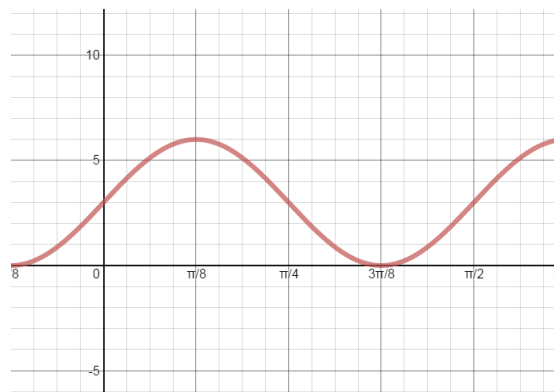
- a) Right 8π
- b) Left 8π
- c) Right $\frac{3\pi}{4}$
- d) Right 3π

_____ 14. Find the vertical shift of $-4 + \cos 3x = y - 3$

- a) Down 4
- b) Down 3
- c) Down 1
- d) Up 3

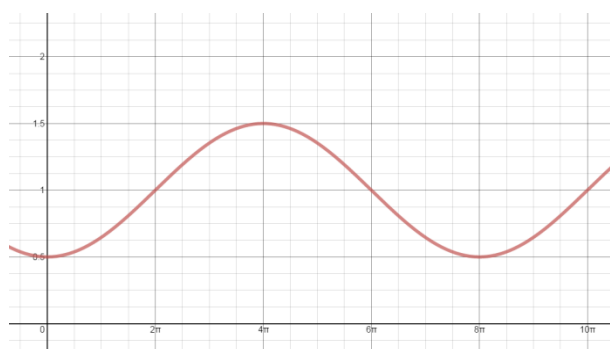
_____ 15. Find the equation of the graph seen here:

- a) $y = 3 \sin 4x + 3$
- b) $y = 3 \sin \frac{\pi}{8}x + 3$
- c) $y = -3 \cos 4x + 6$
- d) $y = -3 \cos \frac{\pi}{8}x + 6$

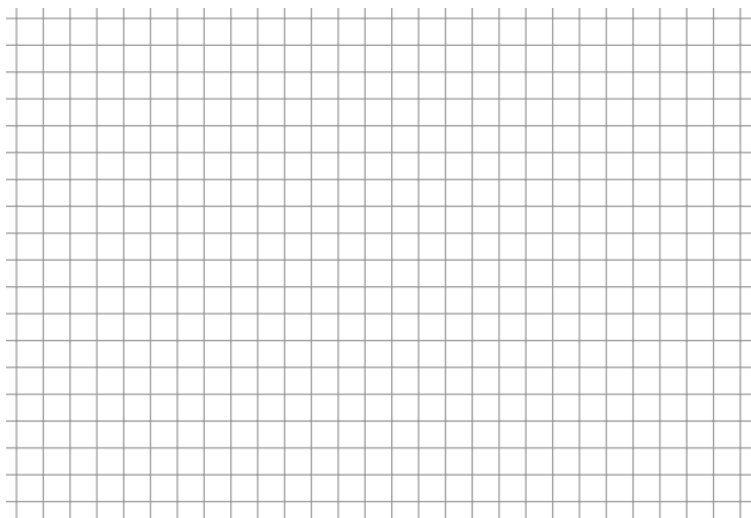


_____ 16. Find the equation of the graph seen here:

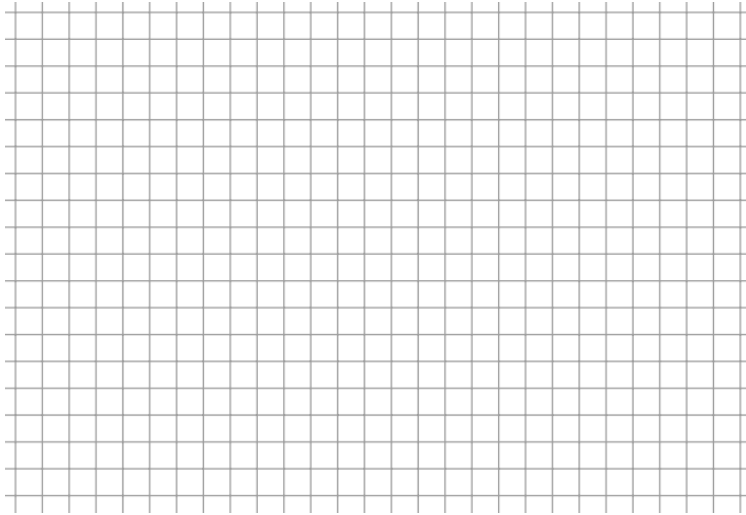
- a) $y = 2 \cos 8x + \frac{1}{2}$
- b) $y = \frac{1}{2} \cos \left(\frac{1}{4}x - \pi \right) + 1$
- c) $y = 2 \sin 8x + \frac{1}{2}$
- d) $y = \frac{1}{2} \sin \left(\frac{1}{4}x - \pi \right) + 1$



17. Graph $y = 3 \cos(2(x + \frac{3\pi}{4})) + 1$



18. Graph $y = \sin\left(\frac{1}{2}x - \pi\right)$



Extra Credit: Fill in the blanks below to complete the brief history of the Ferris Wheel. Each blank will count as $\frac{1}{2}$ a point extra credit.

At the 1893 World's Fair, held in _____, the first Ferris Wheel was introduced to the world. The Ferris Wheel was commissioned by _____ in 1890 to celebrate the _____th anniversary of Columbus' discovery of _____.

