

Name: _____

/25

Part A: Selected Response: Place the letter of the correct response in the space provided.
(12 marks)

1. What is the period of $y = 3\cos\frac{1}{2}(x - \pi)$? 1. _____

(A) $\frac{\pi}{2}$

(B) π

(C) 4π

(D) 8π

2. What is the range of the function $y = \frac{1}{2}\cos 2\left(x - \frac{\pi}{4}\right) - 3$? 2. _____

(A) $\{y \mid -5 \leq y \leq -1, y \in R\}$

(B) $\{y \mid -\frac{7}{2} \leq y \leq -\frac{5}{2}, y \in R\}$

(C) $\{y \mid 1 \leq y \leq 5, y \in R\}$

(D) $\{y \mid \frac{5}{2} \leq y \leq \frac{7}{2}, y \in R\}$

3. What are the transformations of the graph $y = \sin(3\theta - \pi)$? 3. _____

(A) horizontal stretch by a factor of $\frac{1}{3}$ and a horizontal shift of $\frac{\pi}{3}$ units right

(B) horizontal stretch by a factor of $\frac{1}{3}$ and a horizontal shift of π units right

(C) horizontal stretch by a factor of 3 and a horizontal shift of $\frac{\pi}{3}$ units right

(D) horizontal stretch by a factor of 3 and a horizontal shift of π units right

4. Solve for x : $2\sin\theta - \sqrt{3} = 0$ where $0 \leq x \leq 2\pi$. 4. _____

(A) $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$

(B) $\theta = \frac{\pi}{6}, \frac{11\pi}{6}$

(C) $\theta = \frac{\pi}{3}, \frac{4\pi}{3}$

(D) $\theta = \frac{\pi}{3}, \frac{2\pi}{3}$

5. If the point $\left(\frac{\pi}{2}, -2\right)$ lies on the graph of $y = a \cos\left(x - \frac{\pi}{4}\right) - 4$,

what is the value of a ?

5. _____

- (A) $2\sqrt{2}$ (B) $\frac{\sqrt{2}}{2}$
 (C) 2 (D) $\sqrt{2}$

6. The range of a trigonometric function of the form $y = a \sin b(x - c) + d$ is $\{y \mid -2 \leq y \leq 8, y \in R\}$. What is the value of d ?

6. _____

- (A) 1 (B) 3
 (C) 5 (D) 8

7. What is the maximum value of $y = 2 \cos 4\left(x - \frac{\pi}{6}\right) - 5$?

7. _____

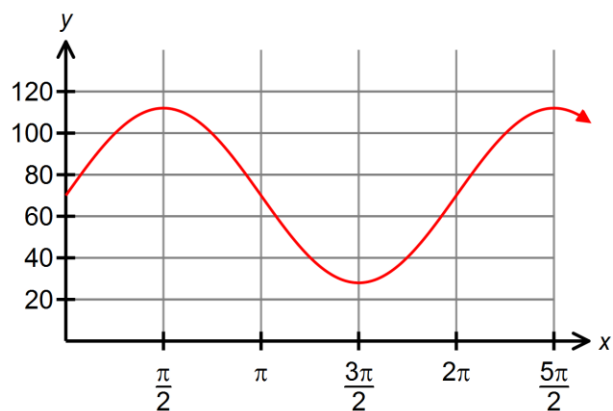
- (A) -7 (B) -3
 (C) 3 (D) 7

8. The partial graph of a trigonometric function is shown. The graph has a maximum value at $\left(\frac{\pi}{2}, 112\right)$ and a minimum value at $\left(\frac{3\pi}{2}, 28\right)$.

Which equation can be used to represent this graph?

8. _____

- (A) $y = 70 \cos\left(x - \frac{\pi}{2}\right) + 42$
 (B) $y = 42 \cos(x - 2\pi) + 70$
 (C) $y = 42 \cos\left(x - \frac{\pi}{2}\right) + 70$
 (D) $y = 70 \cos(x - 2\pi) + 42$



9. Write the equation of the sine function if the amplitude is 3 and the period is $\frac{5\pi}{6}$?

9. _____

- (A) $y = 3 \sin \frac{5\pi}{6} x$ (B) $y = 3 \sin \frac{6}{5\pi} x$
 (C) $y = 3 \sin \frac{5}{12} x$ (D) $y = 3 \sin \frac{12}{5} x$

10. What is the domain of $y = \tan \theta$?

10.____

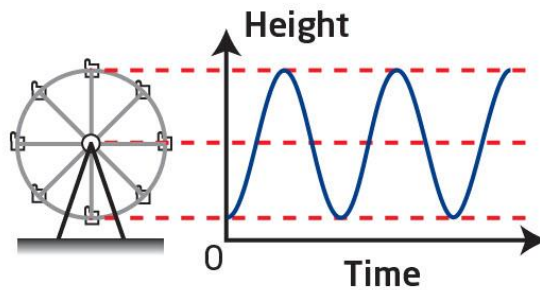
- (A) $x \mid x \neq \frac{\pi}{4} + \pi k, k \in I$
- (B) $x \mid x \neq \frac{\pi}{4} + 2\pi k, k \in I$
- (C) $x \mid x \neq \frac{\pi}{2} + \pi k, k \in I$
- (D) $x \mid x \neq \frac{\pi}{2} + 2\pi k, k \in I$

11. A Ferris wheel with a radius of 6m rotates once every 30 seconds.

Passengers get on board at a point 1m above the ground at the bottom of the Ferris wheel. Which function models this situation?

11.____

- (A) $y = -6\cos\frac{\pi}{15}x + 7$
- (B) $y = -6\cos\frac{15}{\pi}x + 7$
- (C) $y = -\frac{1}{6}\cos\frac{\pi}{15}x + 7$
- (D) $y = -\frac{1}{6}\cos\frac{15}{\pi}x + 7$

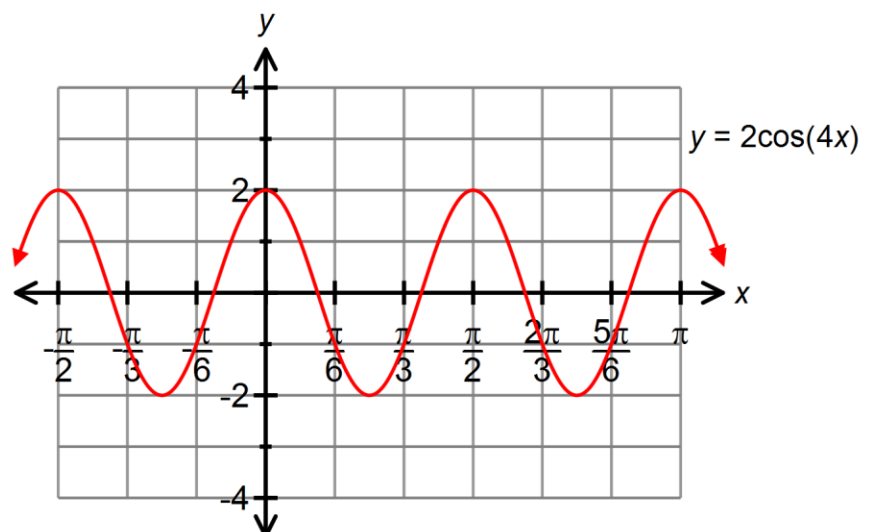


12. Given the graph below, what is the solution for $2\cos 4x = -1$

where $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$?

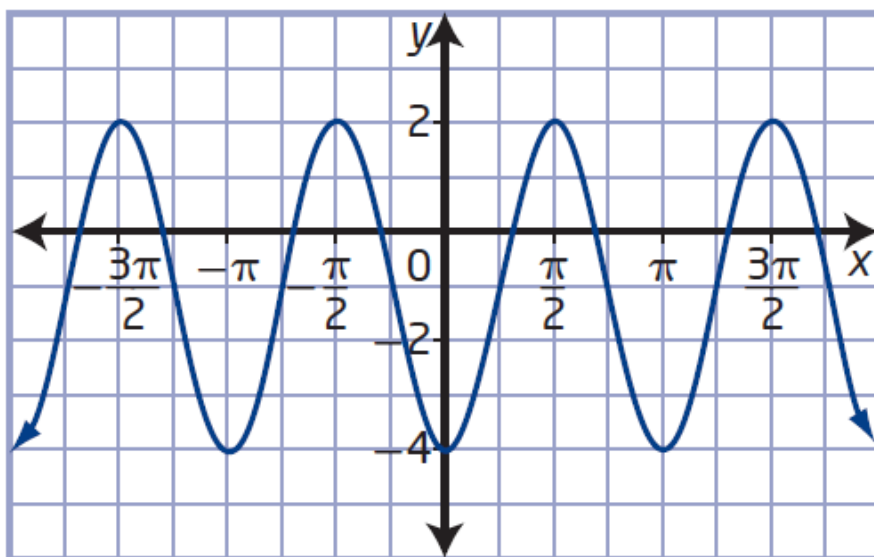
12.____

- (A) $x = \pm\frac{\pi}{3}, \pm\frac{\pi}{6}, \frac{2\pi}{3}, \frac{5\pi}{6}$
- (B) $x = \pm\frac{\pi}{2}, 0$
- (C) $x = \pm\frac{\pi}{3}, \pm\frac{\pi}{6}$
- (D) $x = \pm\frac{\pi}{2}, 0, \pi$



Part B: Constructed Response: Show workings to all problems.

- /4 13. Write the equation for the graph shown in the form $y = a \sin b(x - c) + d$ and in the form $y = a \cos b(x - c) + d$.



Sine graph: _____

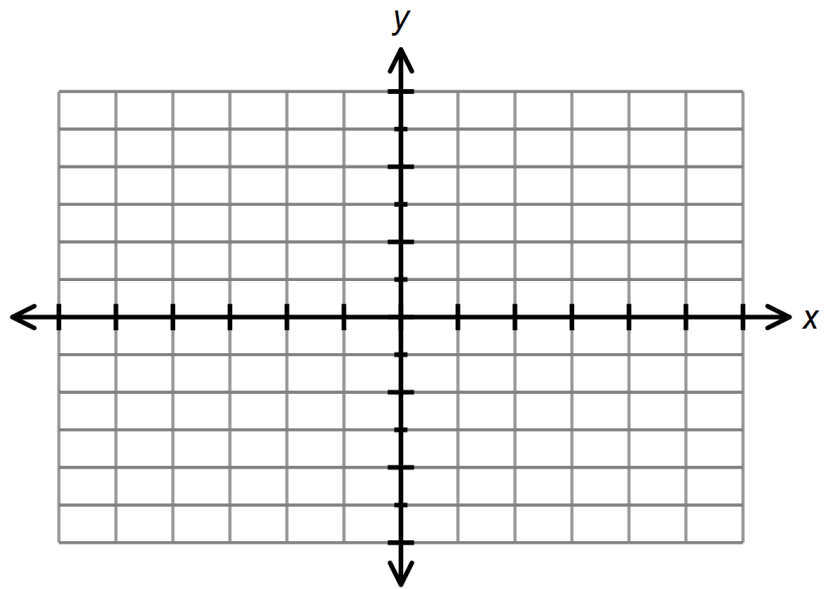
Cosine graph: _____

- /4 14. Determine all solutions, in radian measure, for the equation $\sin\left[\frac{1}{2}\left(\theta - \frac{\pi}{2}\right)\right] = -\frac{\sqrt{3}}{2}$

Solutions: _____

/5 15. Sketch the graph of the function $y = 4 \sin 2\left(x - \frac{\pi}{3}\right) + 1$.

State the domain and the range.



Domain: _____ Range: _____