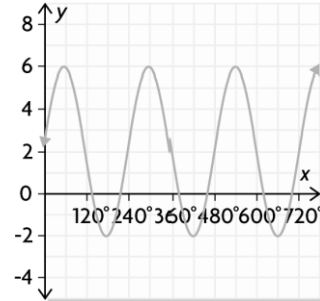


Part I: Multiple Choice. Place the correct answer in the corresponding blank at the end of this section.

1. What is the midline of the following graph?

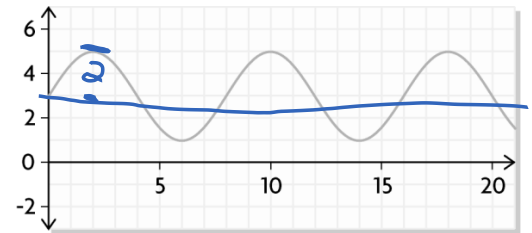
- (A)  $y = 2$
- (B)  $y = 3$
- (C)  $y = 4$
- (D)  $y = 5$

$$\frac{\text{min} + \text{max}}{2} \rightarrow \frac{-2 + 6}{2} = \frac{4}{2} = 2$$



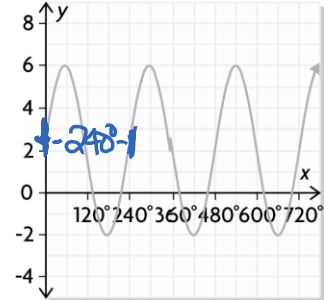
2. What is the amplitude of the following graph?

- (A) 2
- (B) 3
- (C) 4
- (D) 5



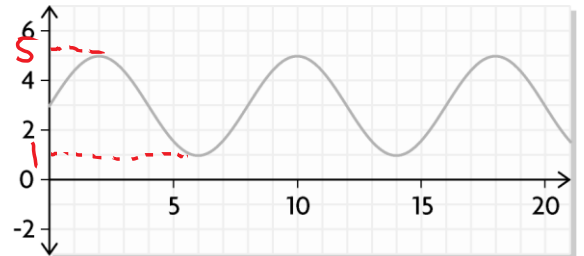
3. What is the period of the following graph?

- (A)  $120^\circ$
- (B)  $240^\circ$
- (C)  $300^\circ$
- (D)  $360^\circ$



4. What is the range of the following graph?

- (A)  $\{y | 1 \leq y \leq 5, y \in \mathbb{R}\}$
- (B)  $\{y | -2 \leq y \leq 2, y \in \mathbb{R}\}$
- (C)  $\{y | 0 \leq y \leq 4, y \in \mathbb{R}\}$
- (D)  $\{y | y \in \mathbb{R}\}$



5. A sinusoidal graph has an amplitude of 10 and a maximum at the point (18, 5).  
What is the midline of the graph?

- (A)  $y = 0$       (B)  $y = -5$   
(C)  $y = 13$       (D)  $y = 8$

$$\begin{aligned} \text{max: } y &= 5 \\ 5 - 10 &= -5 \end{aligned}$$

6. A sinusoidal graph has a maximum at the point (4, -8) and the next minimum is at the point (7, -10). What is the period of the graph?

- (A) 2      (B) 3  
(C) 4      (D) 6

$$\begin{aligned} 7 - 4 &= 3 \\ 2(3) &= 6 \end{aligned}$$

**Part II: Constructed Response. Answer each question in the space provided. Show all workings.**

7. Sketch a possible graph of a sinusoidal function with the following set of characteristics. Explain your decision.

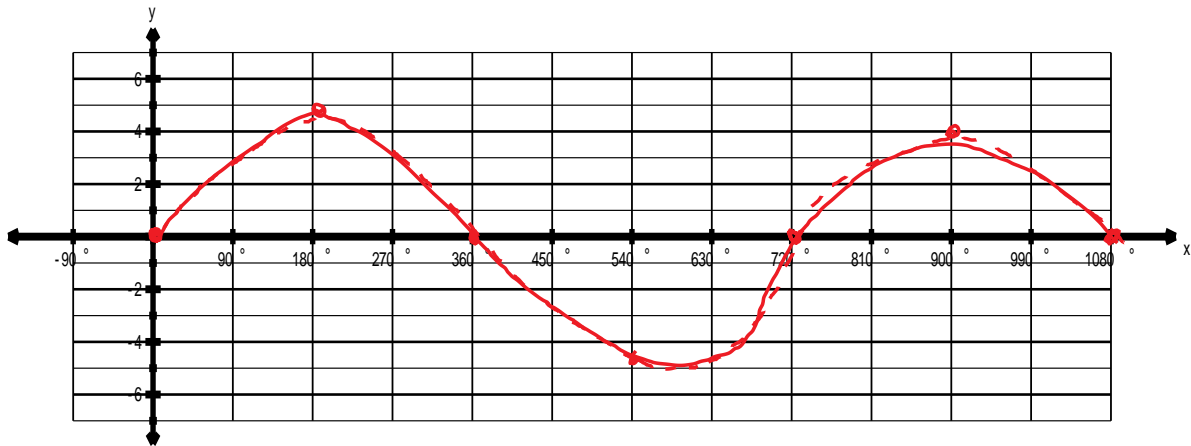
Domain:  $\{x | 0 \leq x \leq 1080^\circ, x \in R\}$

Maximum Value: 5

Minimum Value: -5

Period:  $720^\circ$

y-intercept: 0



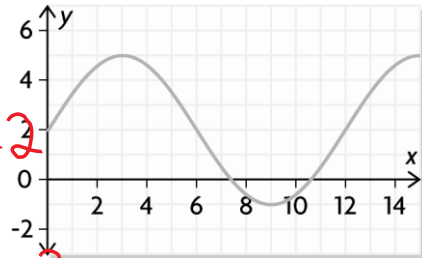
8. The graph of a sinusoidal function is shown. Describe the graph by determining its range, the equation of the midline, its amplitude and its period. Show any work.

Range:  $\{y | -1 \leq y \leq 5, y \in R\}$

midline:  $\frac{5 + (-1)}{2} = \frac{4}{2} = 2 : y = 2$

amplitude:  $\frac{5 - (-1)}{2} = \frac{6}{2} = 3 : y = 3$

period: 12



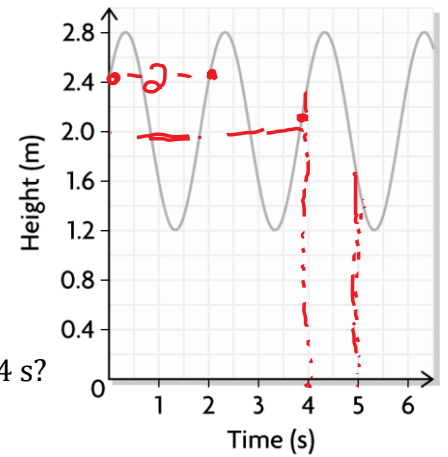
9. Kira is sitting in an inner tube in the wave pool. The depth of the water below her, in terms of time, during a series of waves can be represented by the graph shown.

(A) How long does it take for one complete wave to pass?

2 s

(B) What is the approximate depth of the water below Kira after 4 s?

2 m



(C) How high is each wave?

2.8 m

(D) What is the depth of the water below Kira when no waves are being generated?

2.0 m

(E) What is the depth of the water below Kira at 9s?

1.6 m