A2.A.69: Determine amplitude, period, frequency, and phase shift, given the graph or equation of a periodic function
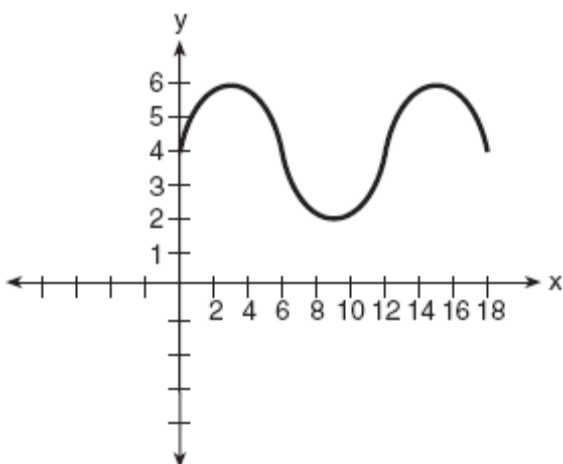
1. 010715b, P.I. A2.A.69
    What is the amplitude of the function shown in the accompanying graph?

    [A] 12   [B] 6   [C] 1.5   [D] 2

2. 060403b, P.I. A2.A.69
    What is the amplitude of the function

    $y = \dfrac{2}{3} \sin 4x$?

    [A] 3π [B] $\dfrac{\pi}{2}$ [C] $\dfrac{2}{3}$ [D] 4

3. 010301b, P.I. A2.A.69
    A monitor displays the graph $y = 3 \sin 5x$.
    What will be the amplitude after a dilation of 2?

    [A] 6   [B] 10   [C] 5   [D] 7

4. 080419b, P.I. A2.A.69
    The path traveled by a roller coaster is modeled by the equation $y = 27 \sin 13x + 30$.
    What is the maximum altitude of the roller coaster?

    [A] 27   [B] 30   [C] 13   [D] 57

5. fall9919b, P.I. A2.A.69
    If $f(x) = 2 \sin 3x + C$, then the maximum value of f(x) is:

    [A] C [B] $C + 3$ [C] $C + 6$ [D] $C + 2$

6. 010810b, P.I. A2.A.69
    A wave displayed by an oscilloscope is represented by the equation $y = 3 \sin x$. What is the period of this function?

    [A] 2   [B] 2π [C] 3π [D] 3

7. 080514b, P.I. A2.A.69
    A certain radio wave travels in a path represented by the equation $y = 5 \sin 2x$.
    What is the period of this wave?

    [A] 2π [B] 5   [C] 2   [D] π

8. 080113b, P.I. A2.A.69
    What is the period of the function
    $y = 5\sin 3x$?

    [A] $\dfrac{2\pi}{3}$ [B] $\dfrac{2\pi}{5}$ [C] 3   [D] 5

9. 010606b, P.I. A2.A.69
    A sound wave is modeled by the curve
    $y = 3\sin 4x$. What is the period of this curve?

    [A] $\dfrac{\pi}{2}$ [B] 3   [C] 4   [D] π

10. 010204b, P.I. A2.A.69
    An object that weighs 2 pounds is suspended
    in a liquid. When the object is depressed 3
    feet from its equilibrium point, it will oscillate
    according to the formula $x = 3\cos(8t)$, where
    t is the number of seconds after the object is
    released. How many seconds are in the
    period of oscillation?

    [A] $\dfrac{\pi}{4}$ [B] 3   [C] π [D] 2π

11. 080615b, P.I. A2.A.69
    What is the period of the graph of the
    equation $y = 2\sin\dfrac{1}{3}x$?

    [A] $\dfrac{2}{3}\pi$ [B] $\dfrac{3\pi}{2}$ [C] 2π [D] 6π

12. 060920b, P.I. A2.A.69
    The Sea Dragon, a pendulum ride at an
    amusement park, moves from its central
    position at rest according to the trigonometric
    function $P(t) = -10\sin(\dfrac{\pi}{3}t)$, where t
    represents time, in seconds. How many
    seconds does it take the pendulum to
    complete one full cycle?

    [A] 5   [B] 6   [C] 10   [D] 3

13. 010425b, P.I. A2.A.69
    The brightness of the star MIRA over time is
    given by the equation $y = 2\sin\dfrac{\pi}{4}x + 6$,
    where x represents time and y represents
    brightness. What is the period of this
    function, in radian measure?

14. 060105b, P.I. A2.A.69
    A modulated laser heats a diamond. Its
    variable temperature, in degrees Celsius, is
    given by $f(t) = T\sin at$. What is the period of
    the curve?

    [A] $\dfrac{2\pi}{a}$ [B] $\dfrac{2a\pi}{a}$ [C] $|T|$ [D] $\dfrac{1}{a}$

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and phase shift, given the graph or equation of a
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[1] D _____

[2] C _____

[3] A _____

[4] D _____

[5] D _____

[6] B _____

[7] D _____

[8] A _____

[9] A _____

[10] A _____

[11] D _____

[12] B _____

[2] 8, and appropriate work is shown.
[1] Appropriate work is shown, but one
computational error is made.
or [1] Appropriate work is shown, but one
conceptual error is made.
or [1] 8, but no work is shown.
[0] A zero response is completely incorrect,
irrelevant, or incoherent or is a correct
response that was obtained by an obviously
[13] incorrect procedure. _____

[14] A _____