MCT 4C   **Review: Trigonometry Part 2**   **Name:** _____
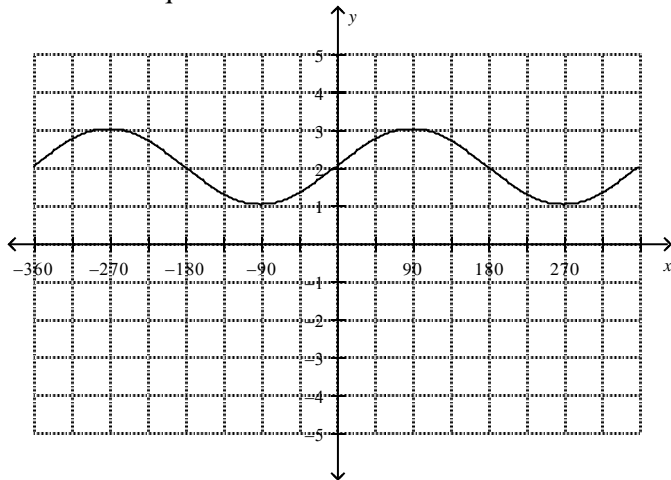
Multiple Choice
*Identify the choice that best completes the statement or answers the question.*

____ 1. Which point is on the graph of $y = \sin x$?
   a. $(0°, 1)$ c. $(180°, 0)$
   b. $(90°, -1)$ d. $(360°, -1)$

____ 2. The function $y = \sin x$ has a period of
   a. $x \in \mathbb{R}$ c. $180°$
   b. $90°$ d. $360°$

____ 3. What is the *y*-intercept of the graph of $y = \cos x$?
   a. 1   c. -1
   b. 0   d. undefined

____ 4. The graph of $y = \cos x$ passes through the point
   a. $(1080°, 1)$ c. $(720°, 0)$
   b. $(900°, 1)$ d. $(360°, 0)$

____ 5. What is the equation of the function?

   a. $y = \sin (x - 2)$ c. $y = \sin (x + 2)$
   b. $y = \sin x + 2$ d. $y = 2 \sin x$

____ 6. If the graph of $y = \sin x$ is translated 60° to the left, the new function is defined by the equation
   a. $y = \sin (x + 60°)$ c. $y = \sin x + 60°$
   b. $y = \sin (x - 60°)$ d. $y = \sin x - 60°$

____ 7. What is the amplitude of the function $y = \cos (x + 180°) - 3$?
   a. $180°$ c. -3
   b. 1   d. $-60°$

____ 8. The minimum value of $y = \cos (x - 180°) + 5$ is
   a. 5   c. -1
   b. 4   d. -6

____ 9. The period of $y = 4 \sin\left(-\dfrac{1}{2} x\right)$ is

   a. $180°$ c. $720°$
   b. $360°$ d. $1440°$

_____ 10. What is the equation of the function?
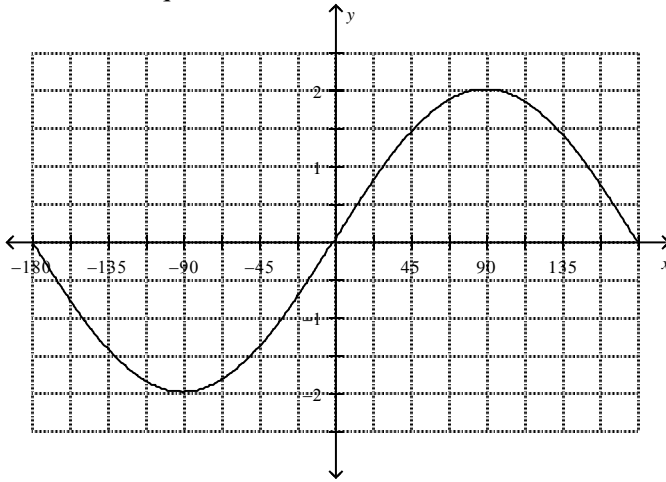
a. $y = 2 \sin x$
b. $y = \dfrac{1}{2} \sin x$

c. $y = \sin 2x$
d. $y = \sin \dfrac{1}{2} x$

_____ 11. What is the range of $y = 2 \sin\left[\dfrac{1}{2}(x - 30°) \right] - 1$?

a. $-3 \le y \le 1$
b. $-2 \le y \le 2$

c. $1 \le y \le 3$
d. $y \in \mathbb{R}$

_____ 12. The period of $y = \dfrac{1}{4} \cos [3(x - 270°)] + 1$ is

a. $90°$
b. $120°$

c. $270°$
d. $1080°$

Full Solution

13. For the function $y = 2 \sin [2(x + 90°)] - 5$, state the amplitude, period, vertical translation, and phase shift.

14. Describe the transformations required to transform the function $y = \cos x$ to the function $y = \dfrac{1}{2} \cos\left[\dfrac{1}{2}(x + 180°) \right] + 3$.

15. Sketch a graph of $y = 2 \sin [2(x - 30°)] + 1$ for $-360° \le x \le 360°$. Determine the phase shift, period, amplitude, vertical translation, domain, and range of the function.

16. Sketch a graph of $y = \dfrac{1}{2} \cos\left[\dfrac{1}{2}(x + 60°) \right] - 1$ for $-360° \le x \le 360°$. Determine the phase shift, period, amplitude, vertical translation, domain, and range of the function.

17. A ride at an amusement park completes one rotation every 90 s. The cars reach a maximum of 3 m above the ground and a minimum of 1 m above the ground. The height, h, in metres, above the ground after t seconds can be represented using a sine function. Determine the period and the equation of this sine function. Identify and explain the restrictions on the domain of this function.

18. In one area of the Pacific Ocean, the tides cause the water level to rise to 4 m above mean sea level and to drop to 4 m below mean sea level. This cycle is completed every 12 h. Assume that the relationship between the depth, d, in metres, of the water and the time, t, in hours, is sinusoidal. Also, assume that at low tide the depth of the water is 1 m. Draw a graph with the given information. Determine the equation that represents how the depth of the water changes over time.

19. Write two possible equations for the function represented on the graph: one as a transformation of y=sin x and one as a transformation of y=cos x.