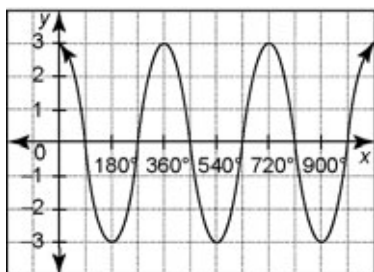


Chapter 5 Test

For questions 1 to 4, select the best answer.

1. Which statement about the graph is not true?



- A The period is 360° .
 B The amplitude is 3.
 C The graph can be represented by the function $y = \sin x$.
 D The domain is $\{x \in \mathbf{R}\}$.
2. A terminal point, $P(x, y)$, is on the unit circle such that it forms a 40° angle in standard position. The coordinates of point P are approximately
- A (0.7660, -0.6428)
 B (0.7660, 0.6428)
 C (-0.6428, -0.7660)
 D (0.6428, 0.7660)
3. The minute hand of a clock is 5 cm in length and starts out pointing at 12 on the clock face. Which function defines the distance of the tip of the minute hand above or below the level of the 9 on the clock face relative to the angle of rotation?
- A $h(\theta) = 5 \sin \theta$
 B $h(\theta) = 5 \sin(\theta + 360^\circ)$
 C $h(\theta) = \sin \theta - 5$
 D $h(\theta) = 5 \sin(\theta + 90^\circ)$

4. Which angle is coterminal with 50° ?

A 230°
 B 410°
 C 750°
 D 40°

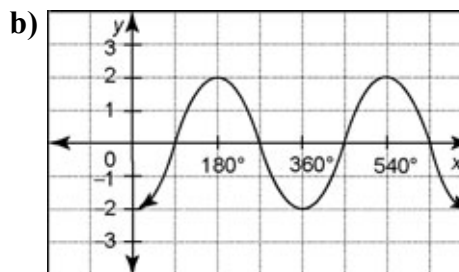
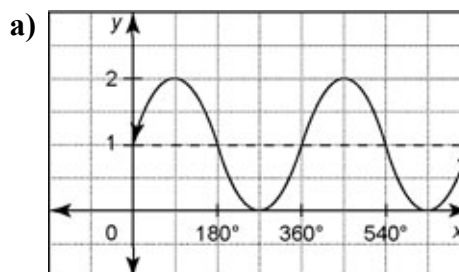
5. Find the measure of angle θ and a non-coterminal angle that gives the same value of $\sin \theta$, if possible. Round your answers to the nearest degree.

a) $\sin \theta = 0.0872$
 b) $\sin \theta = -0.9205$

6. Sketch a graph of each function for two cycles. Determine the period, amplitude, phase shift, domain, range, and the equation of the horizontal axis.

a) $y = 6 \sin x$
 b) $y = \sin x + 4.5$
 c) $y = \sin(x - 270^\circ)$

7. Write an equation for each sine function.



8. A gear is a round wheel with teeth along the circumference. A gear in a particular machine is 3.0 m above the floor and has diameter 1.0 m. A broken tooth is located at the leftmost point on the gear.
- Sketch a graph that represents the height of the broken tooth relative to the angle it forms with the horizontal as the gear rotates 3 times.
 - Determine an equation that represents the height of the broken tooth with respect to angle it forms with the horizontal.
 - Determine an equation that represents the height of the broken tooth above the floor with respect to the angle it forms with the horizontal.
 - The gear completes a revolution once every 180 s. Sketch a graph that represents the height of the broken tooth above the floor with respect to time for 720 s.
 - Determine an equation that represents the height of the broken tooth above the floor with respect to time.
9. The height of a rider on a Ferris wheel can be modelled using the function $h(\theta) = 8 \sin(\theta + 270^\circ) + 11$, where θ is the angle of rotation.
- Use a graphing calculator to sketch a graph of the function.
 - What is the initial height of the rider?
 - What is the height of the rider after a rotation of 120° ?
 - Through what angle has the Ferris wheel rotated the first time the height of the rider is 7 m?
10. The distance, d , that the Earth is from the Sun, in millions of kilometres, can be estimated using the function $d(x) = 2.5 \sin(30x + 60) + 149.5$, where x represents the month, with January = 1, February = 2, and so on.
- Use a graphing calculator to graph the function for one year.
 - Find the maximum and minimum distances the Earth is from the Sun.
 - During which month is the Earth farthest from the Sun?
 - In which two months is the Earth approximately 148.3 million kilometres from the Sun?