

CH-6 Assignment

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- In a circle with radius 9 units, the length of the arc that subtends a positive central angle of θ is $\frac{11}{4}\pi$ units. What is the measure of θ in degrees?

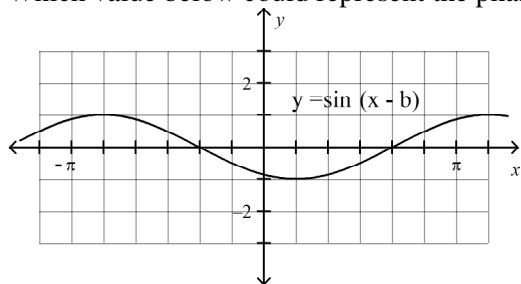
A. $55\pi^\circ$	C. 495°
B. 110°	D. 55°
- Which angle is NOT coterminal with an angle of $-\frac{4}{3}\pi$ radians in standard position?

A. $-\frac{10}{3}\pi$	C. $\frac{2}{3}\pi$
B. $\frac{8}{3}\pi$	D. $-\frac{2}{3}\pi$
- Which point on the unit circle corresponds to $\tan \theta = 1$?

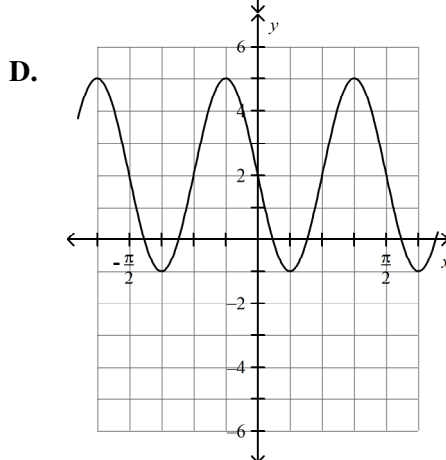
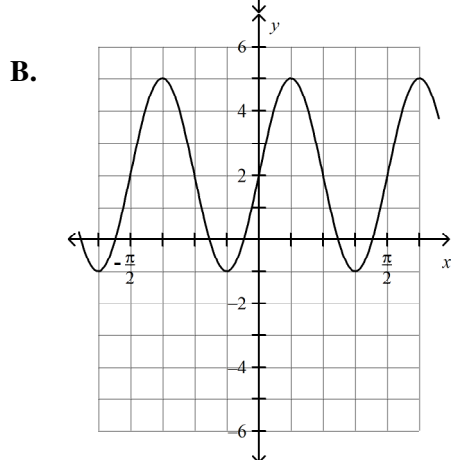
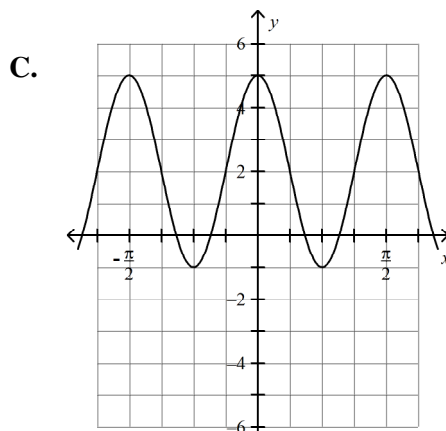
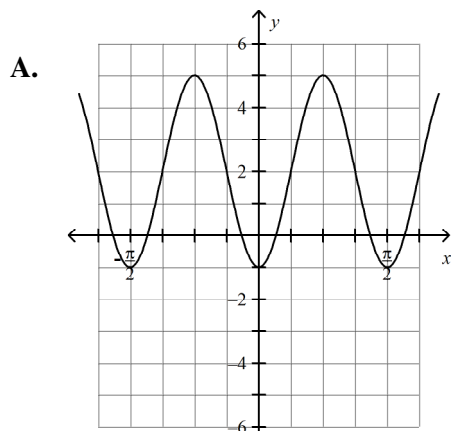
A. $(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$	C. $(1, -\frac{\sqrt{2}}{2})$
B. $(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$	D. $(-\frac{\sqrt{2}}{2}, 1)$
- Which equation below represents a sine function with amplitude 3, period $\frac{\pi}{4}$, equation of centre line $y = 4$, and phase shift $-\frac{\pi}{2}$?

A. $y = 3 \sin \left(\frac{1}{4}x - 4 \right) - \frac{\pi}{2}$	C. $y = 3 \sin 8 \left(x - \frac{\pi}{2} \right) + 4$
B. $y = 3 \sin \frac{1}{4} \left(x + \frac{\pi}{2} \right) + 4$	D. $y = 3 \sin 8 \left(x + \frac{\pi}{2} \right) + 4$

5. This graph is the image of $y = \sin x$ after a phase shift.
Which value below could represent the phase shift?



- A. $-\frac{8\pi}{3}$
B. $\frac{2\pi}{3}$
C. $\frac{4\pi}{3}$
D. $-\frac{2\pi}{3}$
6. Which graph below can be described by $y = 3 \cos 4\left(x - \frac{\pi}{8}\right) + 2$?



7. Which number is NOT in the domain of $y = \tan 6x$?

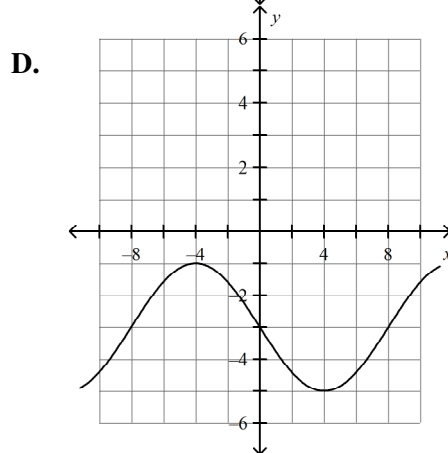
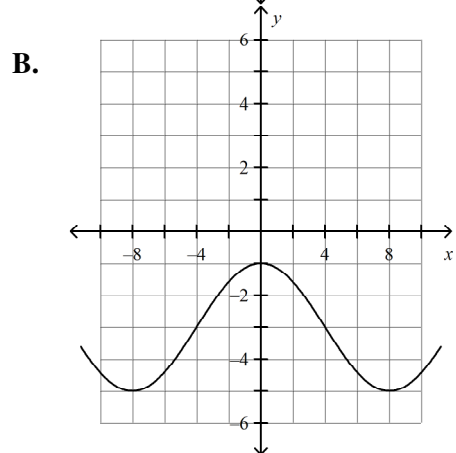
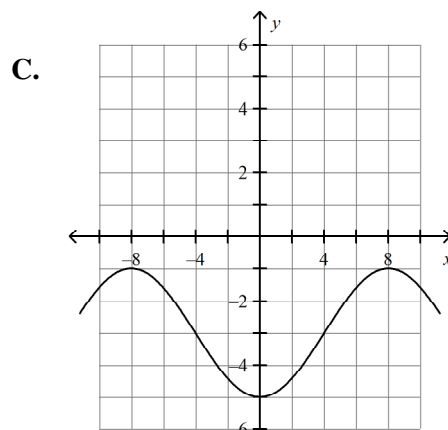
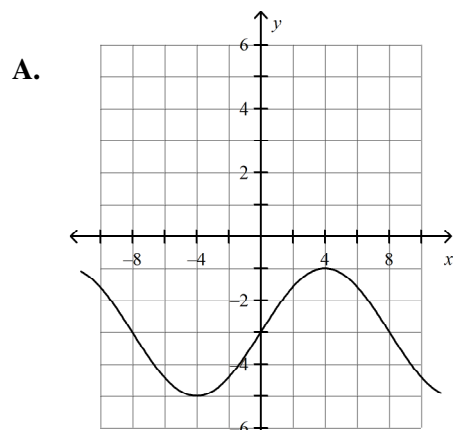
A. $-\frac{7}{12}\pi$

C. $-\frac{1}{6}\pi$

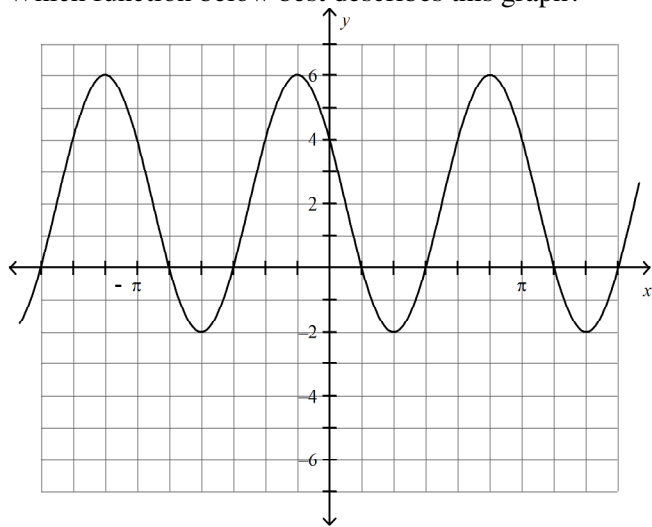
B. $-\frac{1}{3}\pi$

D. $\frac{1}{6}\pi$

8. Which graph below can be described by $y = 2 \sin \frac{\pi}{8}(x - 4) - 3$?



9. Which function below best describes this graph?



A. $y = 4 \cos(x - 2) - \frac{\pi}{6}$

C. $y = 4 \cos\left(x + \frac{\pi}{6}\right) + 2$

B. $y = 4 \cos 2\left(x + \frac{\pi}{6}\right) + 2$

D. $y = 4 \cos 2\left(x - \frac{\pi}{6}\right) + 2$

10. A ball is riding the waves at a beach. The ball's up and down motion with the waves can be described using the formula $h = 3.6 \sin\left(\frac{\pi t}{3}\right)$, where h is the height, in metres, above the flat surface of the water and t is the time, in seconds. What is the height of the ball, to the nearest hundredth of a metre, after $t = 14$ s?

A. 0.87 m

C. 4.16 m

B. -3.12 m

D. 3.12 m

Short Answer (Write the Final Answer on the Response Form)

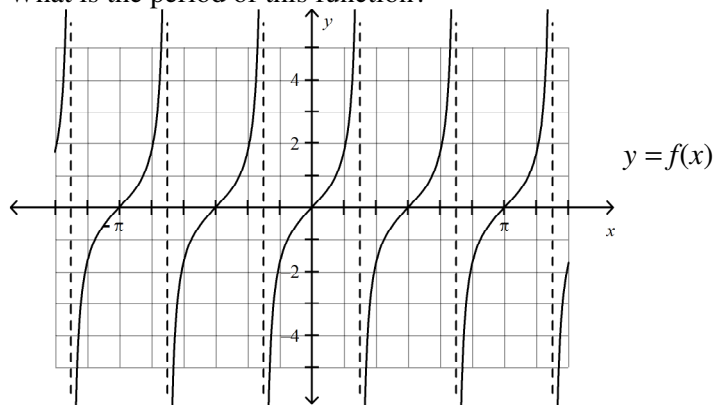
11. The exact radian measure for an angle of 315° is

12. For the point $P(3, -7)$ on the terminal arm of an angle θ in standard position, determine the exact value of $\csc \theta$.

13. Determine a measure for the central angle θ (exact value in radians) in the interval $0 \leq \theta < 2\pi$, such that point $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ is on the terminal arm.

14. What is the measure of the reference angle for an angle of -503° in standard position?
15. An arc with length 19 cm is marked on the circumference of a circle. The central angle subtended by the arc measures $\frac{8\pi}{5}$ radians. To the nearest tenth of a centimetre, determine the radius of the circle.
16. What is the period of the function $y = 8 \sin \frac{6\pi}{7} (x - 2) - 1$?
17. What is the range of the function $y = 7 \cos 3 \left(x + \frac{4\pi}{7} \right) - 5$?
18. Write an equation for a **cosine** function with maximum value 14, minimum value 2, period $\frac{2\pi}{9}$, and phase shift $-\frac{4\pi}{7}$.
19. The water level at an ocean inlet has a depth, d , in metres, that varies with the time, t , in hours after midnight, according to the equation $d = 5 \sin \left[2\pi \left(\frac{t-4}{12.4} \right) \right] + 6$. What is the water depth at 2:30 a.m., to the nearest hundredth of a metre?

20. What is the period of this function?



Open-Ended Responses (Show all work on the Response Form)

21. A Ferris wheel has diameter 42 m. Through what distance does a chair on the wheel travel when the wheel rotates 220° ? Express the exact distance in terms of π .
22. A sinusoidal curve has a minimum point at $\left(-\frac{\pi}{3}, -5\right)$ and the closest maximum point to the right is $\left(\frac{\pi}{6}, 3\right)$. Determine an equation of this curve.
23. A mark on the tip of one blade of a table fan is 21 cm from the axle, and the axle is 35 cm above the table. The fan is turned on when the mark has the position shown. The fan completes one clockwise rotation in $\frac{1}{3}$ s. Write a sinusoidal function that represents the height of the mark, y centimetres, above the table x seconds after the fan is turned on.

