

F.IF.C.7: Graphing Trigonometric Functions 2

- 1 How many full cycles of the function $y = 3 \sin 2x$ appear in π radians?
1) 1 2) 2 3) 3 4) 4

- 2 What is the period of the function $y = 5 \sin 3x$?
1) 5 2) $\frac{2\pi}{5}$ 3) 3 4) $\frac{2\pi}{3}$

- 3 What is the period of the graph $y = \frac{1}{2} \sin 6x$?
1) $\frac{\pi}{6}$ 2) $\frac{\pi}{3}$ 3) $\frac{\pi}{2}$ 4) 6π

- 4 What is the period of the function $f(\theta) = -2 \cos 3\theta$?
1) π 2) $\frac{2\pi}{3}$ 3) $\frac{3\pi}{2}$ 4) 2π

- 5 What is the period of the graph of the equation $y = \frac{1}{3} \sin 2x$?
1) $\frac{1}{3}$ 2) 2 3) π 4) 6π

- 6 What is the period of the graph of the equation $y = 2 \sin \frac{1}{3}x$?
1) $\frac{2}{3}\pi$ 2) 2π 3) 6π 4) $\frac{3\pi}{2}$

- 7 What is the period of $y = \sin 2x$?
1) 4π 2) 2 3) π 4) 4

- 8 What is the period of the function $y = \frac{1}{2} \sin\left(\frac{x}{3} - \pi\right)$?
1) $\frac{1}{2}$ 2) $\frac{1}{3}$ 3) $\frac{2}{3}\pi$ 4) 6π

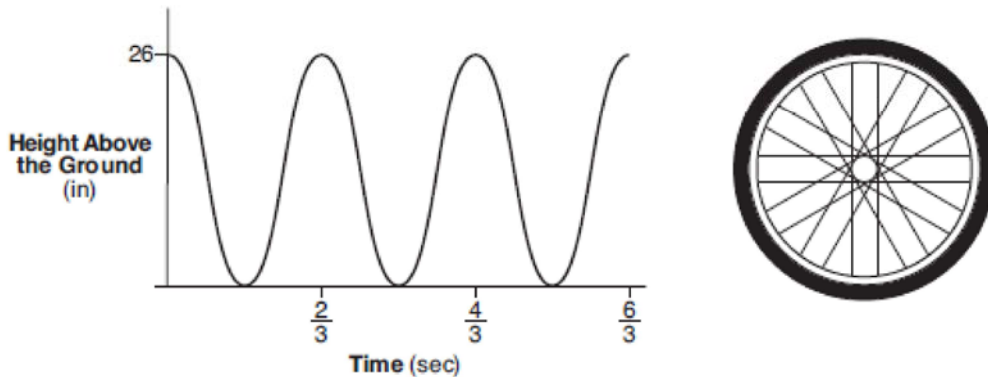
- 9 A certain radio wave travels in a path represented by the equation $y = 5 \sin 2x$. What is the period of this wave?
1) 5 2) 2 3) π 4) 2π

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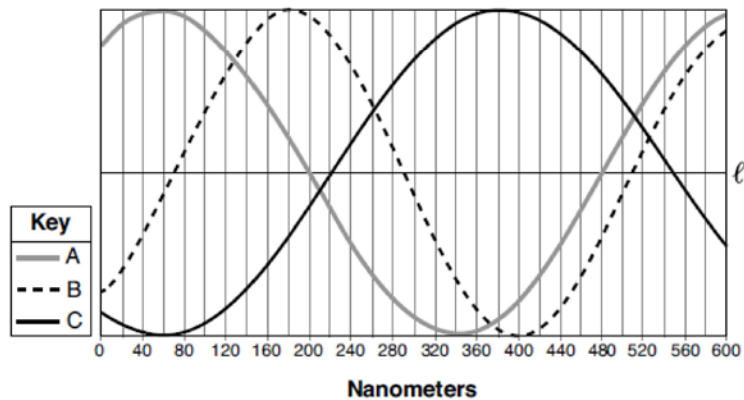
- 10 A sound wave is modeled by the curve $y = 3 \sin 4x$. What is the period of this curve?
1) π 2) $\frac{\pi}{2}$ 3) 3 4) 4
- 11 A wave displayed by an oscilloscope is represented by the equation $y = 3 \sin x$. What is the period of this function?
1) 2π 2) 2 3) 3 4) 3π
- 12 A modulated laser heats a diamond. Its variable temperature, in degrees Celsius, is given by $f(t) = T \sin at$. What is the period of the curve?
1) $|T|$ 2) $\frac{2\pi}{a}$ 3) $\frac{1}{a}$ 4) $\frac{2a\pi}{a}$
- 13 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?
1) $\frac{\pi}{4}$ 2) π 3) 3 4) 2π
- 14 The Sea Dragon, a pendulum ride at an amusement park, moves from its central position at rest according to the trigonometric function $P(t) = -10 \sin\left(\frac{\pi}{3}t\right)$, where t represents time, in seconds. How many seconds does it take the pendulum to complete one full cycle?
1) 5 2) 6 3) 3 4) 10
- 15 The height above ground for a person riding a Ferris wheel after t seconds is modeled by $h(t) = 150 \sin\left(\frac{\pi}{45}t + 67.5\right) + 160$ feet. How many seconds does it take to go from the bottom of the wheel to the top of the wheel?
1) 10 2) 45 3) 90 4) 150
- 16 The graph of which function has a period of 3?
1) $y = -7 \sin\left(\frac{2\pi}{3}x\right) - 5$ 2) $y = -7 \sin\left(\frac{3\pi}{2}x\right) + 9$ 3) $y = -7 \sin(3x) - 5$ 4) $y = 3 \sin(\pi x) + 9$
- 17 The height, above ground, of a Ferris wheel car can be modeled by the function $h(t) = -103.5 \cos\left(\frac{2\pi t}{5}\right) + 108.5$ where h is measured in feet and t is measured in minutes. State the period of the function and describe what the period represents in this context.

- 18 The brightness of the star MIRA over time is given by the equation $y = 2 \sin \frac{\pi}{4} x + 6$, where x represents time and y represents brightness. What is the period of this function, in radian measure?
- 19 The graph below represents the height above the ground, h , in inches, of a point on a triathlete's bike wheel during a training ride in terms of time, t , in seconds.



Identify the period of the graph and describe what the period represents in this context.

- 20 Visible light can be represented by sinusoidal waves. Three visible light waves are shown in the graph below. The midline of each wave is labeled ℓ .



Based on the graph, which light wave has the longest period? Justify your answer.

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Answer Section

1 ANS: 1

$$\frac{2\pi}{2} = \pi$$

$$\frac{\pi}{\pi} = 1$$

REF: 061519a2

2 ANS: 4

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{3}$$

REF: 080113b

3 ANS: 2

$$\frac{2\pi}{6} = \frac{\pi}{3}$$

REF: 061413a2

4 ANS: 2

$$\frac{2\pi}{b} = \frac{2\pi}{3}$$

REF: 061111a2

5 ANS: 3

$$\frac{2\pi}{2} = \pi$$

REF: 081519a2

6 ANS: 3

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{\frac{1}{3}} = 6\pi$$

REF: 080615b

7 ANS: 3

REF: 069025siii

8 ANS: 4

$$\frac{2\pi}{b} = \frac{2\pi}{\frac{1}{3}} = 6\pi$$

REF: 061027a2

9 ANS: 3

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{2} = \pi$$

REF: 080514b

10 ANS: 2

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{4} = \frac{\pi}{2}$$

REF: 010606b

11 ANS: 1

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{1} = 2\pi$$

REF: 010810b

12 ANS: 2

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{a}$$

REF: 060105b

13 ANS: 1

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{8} = \frac{\pi}{4}$$

REF: 010204b

14 ANS: 2

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{\frac{\pi}{3}} = 6$$

REF: 060920b

15 ANS: 2

$$P = \frac{2\pi}{\frac{\pi}{45}} = 90$$

REF: 081822aii

16 ANS: 1

$$P = \frac{2\pi}{\frac{2\pi}{3}} = 3$$

REF: 082413aii

17 ANS:

$$\frac{2\pi}{\frac{2\pi}{5}} = 5 \text{ The wheel rotates every 5 minutes.}$$

REF: 062429aii

18 ANS:

$$8. \text{ period} = \frac{2\pi}{b} = \frac{2\pi}{\frac{\pi}{4}} = 8.$$

REF: 010425b

19 ANS:

period is $\frac{2}{3}$. The wheel rotates once every $\frac{2}{3}$ second.

REF: 061728aii

20 ANS:

Light wave C. The periods for A, B, and C are 280, 220 and 320.

REF: 012030aii