

F.IF.B.4 Graphing Trigonometric Functions

- The maximum value of the function $y = 3 \sin 2x$ is
 - π
 - 2
 - 3
 - 2π
- What is the minimum value of $f(\theta)$ in the equation $f(\theta) = 3 \sin 4\theta$?
 - 1
 - 2
 - 3
 - 4
- What is the maximum value for the function $y = \frac{1}{3} \sin 5x$ is:
 - $-\frac{1}{3}$
 - $\frac{1}{3}$
 - $\frac{1}{5}$
 - 5
- If $f(x) = 2 \sin 3x + C$, then the maximum value of $f(x)$ is:
 - C
 - $C + 2$
 - $C + 3$
 - $C + 6$
- What is the maximum value of y for the equation $y = 1 + 3 \sin x$?
 - 1
 - 2
 - 3
 - 4
- 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?
 - 13
 - 27
 - 30
 - 57
- The Ferris wheel at the landmark Navy Pier in Chicago takes 7 minutes to make one full rotation. The height, H , in feet, above the ground of one of the six-person cars can be modeled by $H(t) = 70 \sin\left(\frac{2\pi}{7}(t - 1.75)\right) + 80$, where t is time, in minutes. Using $H(t)$ for one full rotation, this car's minimum height, in feet, is
 - 150
 - 70
 - 10
 - 0

- 8 Based on climate data that have been collected in Bar Harbor, Maine, the average monthly temperature, in degrees F, can be modeled by the equation $B(x) = 23.914 \sin(0.508x - 2.116) + 55.300$. The same governmental agency collected average monthly temperature data for Phoenix, Arizona, and found the temperatures could be modeled by the equation $P(x) = 20.238 \sin(0.525x - 2.148) + 86.729$. Which statement can *not* be concluded based on the average monthly temperature models x months after starting data collection?
- 1) The average monthly temperature variation is more in Bar Harbor than in Phoenix.
 - 2) The midline average monthly temperature for Bar Harbor is lower than the midline temperature for Phoenix.
 - 3) The maximum average monthly temperature for Bar Harbor is 79° F, to the nearest degree.
 - 4) The minimum average monthly temperature for Phoenix is 20° F, to the nearest degree.
- 9 Relative to the graph of $y = 3 \sin x$, what is the shift of the graph of $y = 3 \sin\left(x + \frac{\pi}{3}\right)$?
- 1) $\frac{\pi}{3}$ right
 - 2) $\frac{\pi}{3}$ left
 - 3) $\frac{\pi}{3}$ up
 - 4) $\frac{\pi}{3}$ down
- 10 Given the parent function $p(x) = \cos x$, which phrase best describes the transformation used to obtain the graph of $g(x) = \cos(x + a) - b$, if a and b are positive constants?
- 1) right a units, up b units
 - 2) right a units, down b units
 - 3) left a units, up b units
 - 4) left a units, down b units
- 11 Which transformation could be used to make the graph of the equation $y = \sin x$ coincide with the graph of the equation $y = \cos x$?
- 1) translation
 - 2) rotation
 - 3) dilation
 - 4) point reflection
- 12 The graph of the equation $y = |\sin x|$ will contain *no* points in Quadrants
- 1) I and II
 - 2) II and III
 - 3) III and IV
 - 4) I and IV
- 13 Which type of symmetry does the equation $y = \cos x$ have?
- 1) line symmetry with respect to the x -axis
 - 2) line symmetry with respect to $y = x$
 - 3) point symmetry with respect to the origin
 - 4) point symmetry with respect to $\left(\frac{\pi}{2}, 0\right)$

- 14 The graph of which equation is symmetric with respect to the origin?
1) $y = -3$
2) $x = 2$
3) $y = \sin x$
4) $y = \cos x$
- 15 As angle x increases from 180° to 270° , the value of $\cos x$ will
1) increase from 0 to 1
2) increase from -1 to 0
3) decrease from 0 to -1
4) decrease from 1 to 0
- 16 As θ increases from π to $\frac{3\pi}{2}$, which statement is true?
1) $\sin \theta$ increases from -1 to 0.
2) $\sin \theta$ decreases from 1 to 0.
3) $\cos \theta$ decreases from 0 to -1 .
4) $\cos \theta$ increases from -1 to 0.
- 17 As θ increases from $\frac{\pi}{2}$ to $\frac{3\pi}{2}$, the value of $\cos \theta$
1) decreases, only
2) increases, only
3) decreases and then increases
4) increases and then decreases
- 18 As angle x increases from $\frac{\pi}{2}$ to π , the value of $\sin x$ will
1) increase from -1 to 0
2) increase from 0 to 1
3) decrease from 0 to -1
4) decrease from 1 to 0
- 19 As x increases from π to 2π , the value of $\sin x$
1) increases, only
2) decreases, only
3) increases, then decreases
4) decreases, then increases
- 20 As angle θ increases from π radians to 2π radians, the cosine of θ
1) increases throughout the interval
2) decreases throughout the interval
3) increases, then decreases
4) decreases, then increases
- 21 A sine function increasing through the origin can be used to model light waves. Violet light has a wavelength of 400 nanometers. Over which interval is the height of the wave *decreasing*, only?
1) $(0, 200)$
2) $(100, 300)$
3) $(200, 400)$
4) $(300, 400)$
- 22 As x increases from 0 to $\frac{\pi}{2}$, the graph of the equation $y = 2 \tan x$ will
1) increase from 0 to 2
2) decrease from 0 to -2
3) increase without limit
4) decrease without limit

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Answer Section

1 ANS: 3 REF: 068125siii

2 ANS: 3 REF: 018935siii

3 ANS: 2 REF: 089420siii

4 ANS: 2

The maximum of a sine wave is 1. $2(1) + C = C + 2$.

REF: fall9919b

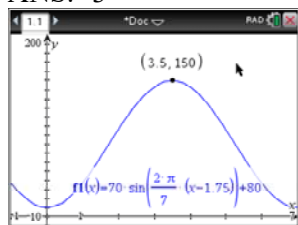
5 ANS: 4 REF: 019033siii

6 ANS: 4

The maximum of a sine wave is 1. $27(1) + 30 = 57$.

REF: 080419b

7 ANS: 3



$H(t)$ is at a minimum at $70(-1) + 80 = 10$

REF: 061613aai

8 ANS: 4

	Bar Harbor	Phoenix
Minimum	31.386	66.491
Midline	55.3	86.729
Maximum	79.214	106.967
Range	47.828	40.476

REF: 061715aai

9 ANS: 2 REF: 011701aai

10 ANS: 4 REF: 061706aai

11 ANS: 1 REF: 010711b

12 ANS: 3 REF: 080903b

13 ANS: 4 REF: 010216b

14 ANS: 3 REF: 018929siii

15 ANS: 2 REF: 068121siii

16 ANS: 4 REF: 068524siii

17 ANS: 3 REF: 089029siii

18 ANS: 4 REF: 060020siii

19 ANS: 4 REF: 080029siii

20 ANS: 1 REF: 060129siii

21 ANS: 2 REF: 081610aai

22 ANS: 3 REF: 081705aai