Graphs of Sine and Cosine

Amplitude, period, phase intuition, and graph construction for sine and cosine.

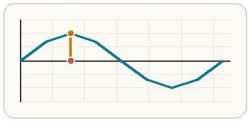
Name _____ Date _____

32 main · 2-up grid · 12 pages · visible side quests

Completion Reward

Shown here as a small pack artifact, not a preview destination.

1. What does amplitude measure on a sine or cosine graph?



Amplitude is the vertical size of the wave from its midline up to a maximum or down to a minimum.

A. The x-value of the first intercept
B. The total width of the graph
C. The distance from the midline to a peak
D. The slope at the origin

1.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

1.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

1.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

1.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

1.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

2. What does period measure on a sine or cosine graph?

A. The horizontal length of one full cycle
B. The highest y-value only
C. The vertical distance between peaks
D. The y-intercept

2.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

2.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

2.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

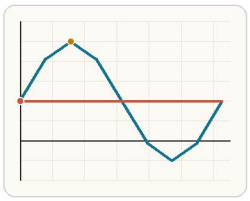
2.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

2.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

3. What is the midline of y = 3sin(x) + 2?



In y = 3sin(x) + 2, the +2 moves the whole graph up, so the midline is y = 2.

A. y = 3
B. x = 2
C. x = 3
D. y = 2

3.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

3.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

3.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

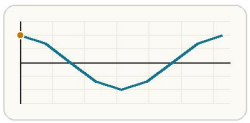
3.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

3.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

4. What value does y = cos(x) have at x = 0?



The basic cosine graph starts at y = 1 when x = 0.

A. 0
B. -1
C. 1
D. 2pi

4.1. Where does the basic cosine graph begin at x = 0?

A. maximum
B. minimum
C. midline rising
D. midline falling

4.2. The period of y = cos(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

4.3. For y = -5cos(x), the amplitude is:

A. -5
B. 5
C. 1
D. 10

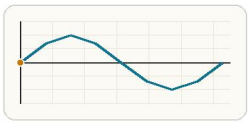
4.4. For y = 2cos(x) - 3, the midline is:

A. y = -3
B. y = 2
C. y = 3
D. x = -3

4.5. What does the negative sign do in y = -cos(x)?

A. shifts right
B. reflects across the x-axis
C. changes the period
D. changes the midline

5. What value does y = sin(x) have at x = 0?



The basic sine graph passes through the midline at x = 0, so its value there is 0.

A. 1
B. -1
C. 2pi
D. 0

5.1. What is sin(0)?

A. 0
B. 1
C. -1
D. undefined

5.2. At x = pi/2, the basic sine graph has value:

A. -1
B. 0
C. 1
D. 2

5.3. Which feature belongs to the basic sine graph?

A. starts at a maximum
B. starts at a minimum
C. starts at the midline and rises
D. is always below the axis

5.4. A basic sine graph crosses its midline at x = 0 and also at:

A. pi/2
B. pi
C. 3pi/2
D. 2

5.5. Which statement matches the basic sine graph?

A. starts at 1
B. starts at 0
C. starts at -1
D. has no starting value

6. What is the amplitude of y = 4cos(x)?

A. 1
B. 2pi
C. 4
D. 0

6.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

6.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

6.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

6.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

6.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

7. What is the period of y = sin(x)?

A. pi
B. 4pi
C. 1
D. 2pi

7.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

7.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

7.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

7.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

7.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

8. What is the period of y = cos(x)?

A. pi
B. 4pi
C. 1
D. 2pi

8.1. Where does the basic cosine graph begin at x = 0?

A. maximum
B. minimum
C. midline rising
D. midline falling

8.2. The period of y = cos(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

8.3. For y = -5cos(x), the amplitude is:

A. -5
B. 5
C. 1
D. 10

8.4. For y = 2cos(x) - 3, the midline is:

A. y = -3
B. y = 2
C. y = 3
D. x = -3

8.5. What does the negative sign do in y = -cos(x)?

A. shifts right
B. reflects across the x-axis
C. changes the period
D. changes the midline

9. Which equation has amplitude 3?

A. y = sin(3x)
B. y = 3sin(x)
C. y = sin(x) + 3
D. y = cos(x / 3)

9.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

9.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

9.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

9.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

9.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

10. Which equation has midline y = 2?

A. y = 2sin(x)
B. y = sin(2x)
C. y = sin(x) + 2
D. y = 2cos(2x)

10.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

10.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

10.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

10.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

10.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

11. Which equation has period pi?

A. y = sin(2x)
B. y = sin(x)
C. y = sin(x / 2)
D. y = 2sin(x)

11.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

11.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

11.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

11.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

11.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

12. Which basic graph starts at a maximum when x = 0?

A. y = cos(x)
B. y = sin(x)
C. y = tan(x)
D. y = x

12.1. Where does the basic cosine graph begin at x = 0?

A. maximum
B. minimum
C. midline rising
D. midline falling

12.2. The period of y = cos(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

12.3. For y = -5cos(x), the amplitude is:

A. -5
B. 5
C. 1
D. 10

12.4. For y = 2cos(x) - 3, the midline is:

A. y = -3
B. y = 2
C. y = 3
D. x = -3

12.5. What does the negative sign do in y = -cos(x)?

A. shifts right
B. reflects across the x-axis
C. changes the period
D. changes the midline

13. Which basic graph starts at 0 when x = 0?

A. y = cos(x)
B. y = sin(x)
C. y = sec(x)
D. y = x^2

13.1. What is sin(0)?

A. 0
B. 1
C. -1
D. undefined

13.2. At x = pi/2, the basic sine graph has value:

A. -1
B. 0
C. 1
D. 2

13.3. Which feature belongs to the basic sine graph?

A. starts at a maximum
B. starts at a minimum
C. starts at the midline and rises
D. is always below the axis

13.4. A basic sine graph crosses its midline at x = 0 and also at:

A. pi/2
B. pi
C. 3pi/2
D. 2

13.5. Which statement matches the basic sine graph?

A. starts at 1
B. starts at 0
C. starts at -1
D. has no starting value

14. What is the best first step when reading a transformed sine graph?

A. Compute a derivative.
B. Square the equation.
C. Look only at the x-intercepts.
D. Find the midline and amplitude.

14.1. Where does the basic sine graph begin at x = 0?

A. maximum
B. minimum
C. midline
D. undefined

14.2. For y = 4sin(x), the amplitude is:

A. 2
B. 4
C. 8
D. pi

14.3. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

14.4. For y = sin(x) + 2, the midline is:

A. y = 0
B. y = 1
C. y = 2
D. x = 2

14.5. A sine graph with amplitude 3 and midline 1 has a maximum of:

A. 2
B. 3
C. 4
D. 6

15. A student says y = sin(3x) has period 6pi. What is the mistake?

A. The inside factor 3 makes the period shorter, not longer.
B. Sine graphs never have periods.
C. The period should be 3pi because of the coefficient.
D. The graph should be treated as linear.

15.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

15.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

15.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

15.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

15.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

16. What is the amplitude of y = -5sin(x)? Answer with a number.

16.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

16.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

16.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

16.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

16.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

17. What is the amplitude of y = 2cos(x) - 3? Answer with a number.

17.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

17.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

17.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

17.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

17.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

18. Find y when y = 3sin(x) and x = 0. Answer with a number.

18.1. What is sin(0)?

A. 0
B. 1
C. -1
D. undefined

18.2. At x = pi/2, the basic sine graph has value:

A. -1
B. 0
C. 1
D. 2

18.3. Which feature belongs to the basic sine graph?

A. starts at a maximum
B. starts at a minimum
C. starts at the midline and rises
D. is always below the axis

18.4. A basic sine graph crosses its midline at x = 0 and also at:

A. pi/2
B. pi
C. 3pi/2
D. 2

18.5. Which statement matches the basic sine graph?

A. starts at 1
B. starts at 0
C. starts at -1
D. has no starting value

19. Find y when y = 4cos(x) and x = 0. Answer with a number.

19.1. What is sin(0)?

A. 0
B. 1
C. -1
D. undefined

19.2. At x = pi/2, the basic sine graph has value:

A. -1
B. 0
C. 1
D. 2

19.3. Which feature belongs to the basic sine graph?

A. starts at a maximum
B. starts at a minimum
C. starts at the midline and rises
D. is always below the axis

19.4. A basic sine graph crosses its midline at x = 0 and also at:

A. pi/2
B. pi
C. 3pi/2
D. 2

19.5. Which statement matches the basic sine graph?

A. starts at 1
B. starts at 0
C. starts at -1
D. has no starting value

20. Find the midline value of y = 2sin(x) + 5. Answer with a number.

20.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

20.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

20.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

20.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

20.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

21. What is the maximum value of y = 3sin(x) + 1? Answer with a number.

21.1. Where does the basic sine graph begin at x = 0?

A. maximum
B. minimum
C. midline
D. undefined

21.2. For y = 4sin(x), the amplitude is:

A. 2
B. 4
C. 8
D. pi

21.3. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

21.4. For y = sin(x) + 2, the midline is:

A. y = 0
B. y = 1
C. y = 2
D. x = 2

21.5. A sine graph with amplitude 3 and midline 1 has a maximum of:

A. 2
B. 3
C. 4
D. 6

22. What is the minimum value of y = 3sin(x) + 1? Answer with a number.

22.1. Where does the basic sine graph begin at x = 0?

A. maximum
B. minimum
C. midline
D. undefined

22.2. For y = 4sin(x), the amplitude is:

A. 2
B. 4
C. 8
D. pi

22.3. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

22.4. For y = sin(x) + 2, the midline is:

A. y = 0
B. y = 1
C. y = 2
D. x = 2

22.5. A sine graph with amplitude 3 and midline 1 has a maximum of:

A. 2
B. 3
C. 4
D. 6

23. What is the period of y = sin(2x)? Answer with a number.

23.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

23.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

23.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

23.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

23.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

24. Which student correctly finds the amplitude of y = -4cos(x) + 1?

A. Student B: the amplitude is -4 because the coefficient is negative.
B. Student A: the amplitude is 4 because amplitude uses absolute value.
C. Student C: the amplitude is 1 because of the vertical shift.
D. Student D: the amplitude is 5 because -4 + 1 = -3.

24.1. Where does the basic cosine graph begin at x = 0?

A. maximum
B. minimum
C. midline rising
D. midline falling

24.2. The period of y = cos(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

24.3. For y = -5cos(x), the amplitude is:

A. -5
B. 5
C. 1
D. 10

24.4. For y = 2cos(x) - 3, the midline is:

A. y = -3
B. y = 2
C. y = 3
D. x = -3

24.5. What does the negative sign do in y = -cos(x)?

A. shifts right
B. reflects across the x-axis
C. changes the period
D. changes the midline

25. Write an equation with amplitude 3 and no vertical shift using sine. Answer in the form y = ...

25.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

25.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

25.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

25.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

25.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

26. Write an equation with amplitude 2 and no vertical shift using cosine. Answer in the form y = ...

26.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

26.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

26.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

26.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

26.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

27. Write an equation with amplitude 1 and midline y = 4 using sine. Answer in the form y = ...

27.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

27.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

27.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

27.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

27.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

28. Write an equation with amplitude 5 and midline y = -2 using cosine. Answer in the form y = ...

28.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

28.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

28.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

28.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

28.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

29. Write an equation with sine period pi. Answer in the form y = ...

29.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

29.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

29.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

29.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

29.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

30. Write an equation with cosine period pi. Answer in the form y = ...

30.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

30.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

30.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

30.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

30.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

31. For y = 4sin(x) - 1, state the midline. Answer as an equation.

31.1. Amplitude on a sine graph measures:

A. the horizontal length of one cycle
B. the vertical distance from the midline to a peak
C. the x-intercept
D. the starting value

31.2. The period of a sine graph measures:

A. how far it rises
B. one full horizontal cycle length
C. the y-intercept
D. the vertical shift

31.3. What is the midline of y = 2sin(x) + 3?

A. y = 2
B. y = 3
C. x = 3
D. x = 2

31.4. What is the amplitude of y = -5sin(x) + 1?

A. -5
B. 1
C. 4
D. 5

31.5. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

32. For y = 2cos(x) + 3, state the maximum value as an equation in y.

32.1. Where does the basic sine graph begin at x = 0?

A. maximum
B. minimum
C. midline
D. undefined

32.2. For y = 4sin(x), the amplitude is:

A. 2
B. 4
C. 8
D. pi

32.3. The period of y = sin(x) is:

A. pi
B. 2pi
C. 4pi
D. 1

32.4. For y = sin(x) + 2, the midline is:

A. y = 0
B. y = 1
C. y = 2
D. x = 2

32.5. A sine graph with amplitude 3 and midline 1 has a maximum of:

A. 2
B. 3
C. 4
D. 6