Graphs of Sine and Cosine

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

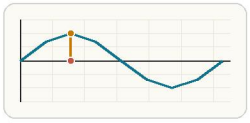
Name _____ Date _____

32 main | 2-up grid | 2 pages

Completion Reward

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

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



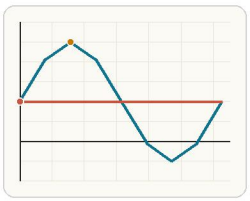
Amplitude is the vertical size of the wave from its midline up to a maximum or down to a minimum.

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

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

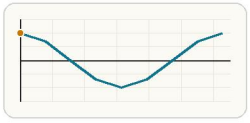
3. What is the midline of y = 3sin(x) + 2?



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

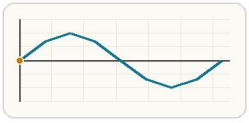
4. What value does y = cos(x) have at x = 0?



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

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

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

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

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

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

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

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

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

9. Which equation has amplitude 3?

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

10. Which equation has midline y = 2?

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

11. Which equation has period pi?

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

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

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

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.

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.

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

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

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

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

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

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

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

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

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.

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

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

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

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

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

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

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

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