

# Sinusoidal Modeling and Wave Behavior

Sinusoidal models, phase and amplitude reasoning, damped motion, and combining periodic waves.

Name \_\_\_\_\_ Date \_\_\_\_\_

32 main 2-up grid 11 pages visible side quests

## Completion Reward



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

### 1. For $y = 3\sin(x)$ , what is the amplitude?

- A. 3
- B.  $1/3$
- C.  $2\pi$
- D. 0

### 1.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

### 1.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

### 1.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

### 1.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

### 1.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

### 2. For $y = 2\cos(x) + 4$ , what is the midline?

- A.  $y = 2$
- B.  $y = 4$
- C.  $y = 0$
- D.  $x = 4$

### 2.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

### 2.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

### 2.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

### 2.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

### 2.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

### 3. For $y = \sin(2x)$ , what is the period?

- A.  $2\pi$
- B.  $4\pi$
- C.  $1/2$
- D.  $\pi$

### 3.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

### 3.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

### 3.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

### 3.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

### 3.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**4. Compared to  $y = \sin(x)$ , what does  $y = \sin(3x)$  do?**

- A. It triples the amplitude
- B. It moves the graph up 3
- C. It reflects the graph
- D. It completes cycles three times as fast

**4.1. In a Ferris wheel model, amplitude tells you:**

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

**4.2. In a tide model, the period tells you:**

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

**4.3. In a sinusoidal model, the midline usually represents:**

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

**4.4. If a wave is shifted upward by 6, which feature changed?**

- A. amplitude
- B. midline
- C. period
- D. frequency only

**4.5. A wave with amplitude 4 and midline 1 will have a maximum of:**

- A. 3
- B. 4
- C. 5
- D. 9

**5. What does  $y = \sin(x - \pi / 4)$  do to  $y = \sin(x)$ ?**

- A. Shifts it right by  $\pi / 4$
- B. Shifts it left by  $\pi / 4$
- C. Shifts it up by  $\pi / 4$
- D. Reflects it over the x-axis

**5.1. In a Ferris wheel model, amplitude tells you:**

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

**5.2. In a tide model, the period tells you:**

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

**5.3. In a sinusoidal model, the midline usually represents:**

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

**5.4. If a wave is shifted upward by 6, which feature changed?**

- A. amplitude
- B. midline
- C. period
- D. frequency only

**5.5. A wave with amplitude 4 and midline 1 will have a maximum of:**

- A. 3
- B. 4
- C. 5
- D. 9

**6. What does  $y = -2\sin(x)$  do compared to  $y = \sin(x)$ ?**

- A. Shifts up 2
- B. Triples the period
- C. Shifts right 2
- D. Reflects across the x-axis and doubles the amplitude

**6.1. In a Ferris wheel model, amplitude tells you:**

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

**6.2. In a tide model, the period tells you:**

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

**6.3. In a sinusoidal model, the midline usually represents:**

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

**6.4. If a wave is shifted upward by 6, which feature changed?**

- A. amplitude
- B. midline
- C. period
- D. frequency only

**6.5. A wave with amplitude 4 and midline 1 will have a maximum of:**

- A. 3
- B. 4
- C. 5
- D. 9

7. If you want the maximum of  $y = 4\sin(x) - 1$ , what should you read first?

- A. Only the period
- B. The amplitude and midline
- C. Only the phase shift
- D. The x-intercepts first

7.1. For  $y = 3\sin(x)$ , the amplitude is:

- A. 1
- B. 2
- C. 3
- D. 6

7.2. For  $y = 2\cos(x) + 4$ , the midline is:

- A.  $y = 2$
- B.  $y = 4$
- C.  $y = 6$
- D.  $x = 4$

7.3. The period of  $y = \sin(x)$  is:

- A.  $\pi$
- B.  $2\pi$
- C.  $4\pi$
- D. 1

7.4. Where does  $y = \cos(x)$  start when  $x = 0$ ?

- A. At a maximum
- B. At the midline rising
- C. At the midline falling
- D. At a minimum

7.5. For  $y = \sin(x) - 2$ , the graph is shifted:

- A. up 2
- B. down 2
- C. right 2
- D. left 2

8. A Ferris wheel repeats every 20 seconds and has radius 6. What features belong in the model first?

- A. Amplitude 20 and period 6
- B. Midline 6 and period 20
- C. Amplitude 6 and period 20
- D. Only a phase shift

8.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

8.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

8.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

8.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

8.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

9. A student says the period of  $y = \cos(4x)$  is  $8\pi$ . What is the mistake?

- A. They forgot the amplitude
- B. They multiplied by 4 instead of dividing by 4
- C. They used sine instead of cosine
- D. Nothing is wrong

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

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

9.2. For  $y = 4\sin(x)$ , the amplitude is:

- A. 2
- B. 4
- C. 8
- D.  $\pi$

9.3. The period of  $y = \sin(x)$  is:

- A.  $\pi$
- B.  $2\pi$
- C.  $4\pi$
- D. 1

9.4. For  $y = \sin(x) + 2$ , the midline is:

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

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

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

10. A student says the amplitude of  $y = -5\cos(x) + 2$  is -5. What is the mistake?

- A. Amplitude is 2 because of the vertical shift
- B. Amplitude is x because cosine depends on x
- C. Amplitude is -5 because the graph is reflected
- D. Amplitude is always nonnegative, so it is 5

10.3. The period of  $y = \sin(x)$  is:

- A.  $\pi$
- B.  $2\pi$
- C.  $4\pi$
- D. 1

11. For  $y = 3\sin(x) + 2$ , what is the maximum value? Answer with a number.

11.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

12. For  $y = 3\sin(x) + 2$ , what is the minimum value? Answer with a number.

12.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

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

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

10.4. For  $y = \sin(x) + 2$ , the midline is:

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

11.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

11.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

12.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

12.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

10.2. For  $y = 4\sin(x)$ , the amplitude is:

- A. 2
- B. 4
- C. 8
- D.  $\pi$

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

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

11.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

11.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

12.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

12.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**13. A sinusoid has maximum 9 and minimum 1. What is its amplitude? Answer with a number.**

13.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

13.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

13.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

13.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

13.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**14. A sinusoid has maximum 9 and minimum 1. What is its midline value? Answer with a number.**

14.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

14.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

14.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

14.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

14.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**15. For  $y = \cos(4x)$ , what is the period? Answer as an exact value.**

15.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

15.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

15.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

15.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

15.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

16. For  $y = \sin(x/2)$ , what is the period? Answer as an exact value.

16.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

16.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

16.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

16.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

16.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

17. Find  $y$  when  $x = \pi/2$  for  $y = 2\sin(x) - 3$ . Answer with a number.

17.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

17.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

17.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

17.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

17.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

18. Find  $y$  when  $x = 0$  for  $y = 5\cos(x) + 1$ . Answer with a number.

18.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

18.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

18.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

18.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

18.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**19. A sinusoidal model has period 12. What is the value of  $b$  in  $y = A \sin(bx) + D$ ? Answer as an exact value.**

19.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

19.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

19.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

19.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

19.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**20. A sinusoidal model has period 8. What is the value of  $b$  in  $y = A \cos(bx) + D$ ? Answer as an exact value.**

20.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

20.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

20.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

20.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

20.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**21. A model is  $y = 6\sin((\pi / 10)x)$ . Find  $y$  when  $x = 5$ . Answer with a number.**

21.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

21.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

21.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

21.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

21.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

22. A model is  $y = 4\cos((\pi / 6)x) - 2$ . Find  $y$  when  $x = 3$ . Answer with a number.

22.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

22.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

22.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

22.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

22.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

23. Write a sine model with amplitude 3, period  $2\pi$ , and midline 1. Answer as an equation.

23.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

23.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

23.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

23.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

23.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

24. Write a cosine model with amplitude 2, period  $\pi$ , and midline -1. Answer as an equation.

24.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

24.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

24.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

24.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

24.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**25. A sinusoid has maximum 11 and minimum 3. Write its midline. Answer as an equation.**

25.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

**26. A sinusoid has maximum 10 and minimum -2. Write its amplitude as a number. Answer as an equation.**

26.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

**27. Write the inside expression for a sine graph shifted right  $\pi/3$ . Answer as an equation.**

27.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

25.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

25.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

26.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

26.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

27.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

27.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
- D. frequency only

25.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

25.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

26.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

26.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

27.2. In a tide model, the period tells you:

- A. the highest water level
- B. how long one full cycle takes
- C. the midline height
- D. the horizontal shift

27.5. A wave with amplitude 4 and midline 1 will have a maximum of:

- A. 3
- B. 4
- C. 5
- D. 9

**28. Write a cosine model with amplitude 4 reflected across the x-axis and no shifts. Answer as an equation.**

28.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

**29. A Ferris wheel radius is 7 and the center is 9 units above the ground. Write the amplitude-midline part of a model. Answer as an equation.**

29.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
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**30. For  $y = A \sin(bx) + D$ , write the period. Answer as an expression.**

30.3. In a sinusoidal model, the midline usually represents:

- A. the maximum value
- B. the average level
- C. the period
- D. the phase shift

28.1. In a Ferris wheel model, amplitude tells you:

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

28.4. If a wave is shifted upward by 6, which feature changed?

- A. amplitude
- B. midline
- C. period
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**31. Which description matches  $y = 3\sin(x) + 1$ ?**

- A. Amplitude 1 and midline  $y = 3$
- B. Amplitude 3 and midline  $y = 1$
- C. Period 3 and midline  $y = 0$
- D. Amplitude 4 and midline  $y = 0$

**31.1. In a Ferris wheel model, amplitude tells you:**

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**32. Which description matches  $y = 2\cos(x - \pi/2)$ ?**

- A. Amplitude 2, shifted left  $\pi/2$
- B. Amplitude 2, shifted right  $\pi/2$
- C. Midline 2, shifted right  $\pi/2$
- D. Reflected and shifted down 2

**32.1. In a Ferris wheel model, amplitude tells you:**

- A. how far the rider moves above and below the midline
- B. the starting time
- C. the horizontal shift only
- D. the number of cycles

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