

Unit 6 Test — Answer Key

Amplitude, Period, Phase Shift & Vertical Shift

FOR TEACHER / SELF-CHECK USE

This test was written to cover Unit 6's topics (amplitude, period, phase shift, vertical shift, and graphing transformations of trigonometric functions). Every solution below has been independently verified.

1	Amplitude is the coefficient in front of sine: $ 3 = 3$. Answer: A — 3
2	Period = $2\pi/b$, where $b = 2$. Period = $2\pi/2$. Answer: A — π
3	Period = $2\pi/b$, where $b = 1/3$. Period = $2\pi \div (1/3) = 2\pi \cdot 3$. Answer: 6π
4	$y = \sin(x - c)$ shifts the graph right by c . Here $c = \pi/4$. Answer: A — Right $\pi/4$
5	Adding a constant outside the trig function shifts the graph vertically by that amount: +5 means up 5. Answer: A — Up 5
6	Amplitude 4 $\rightarrow$ coefficient 4. Period $\pi \rightarrow 2\pi/b = \pi$ means $b = 2$. No phase or vertical shift means no added constants. Answer: $y = 4\sin(2x)$
7	$\sin(x)$ ranges over $[-1, 1]$, so $2\sin(x)$ ranges over $[-2, 2]$. Subtracting 3 shifts the range to $[-2-3, 2-3] = [-5, -1]$. Answer: A — $[-5, -1]$
8	Period of $\sin(bx)$ or $\cos(bx)$ is $2\pi/b$; period of $\tan(bx)$ is π/b . For $y = \sin(2x)$: $2\pi/2 = \pi$. For $y = \sin(x)$: 2π . For $y = \cos(x/2)$: $2\pi/(1/2) = 4\pi$. For $y = \tan(x/2)$: $\pi/(1/2) = 2\pi$. Answer: A — $y = \sin(2x)$
9	Standard form $y = A \cos(Bx - C) + D$: $A = -3$, $B = 2$, $C = \pi$, $D = 1$. Amplitude = $ A = 3$. Period = $2\pi/B = 2\pi/2 = \pi$. Phase shift = $C/B = \pi/2$ (right). Vertical shift = $D = 1$ (up). Answer: Amplitude 3, period π, phase shift right $\pi/2$, vertical shift up 1
10	Standard form $y = A \sin(x - C) + D$ with $A = 2$, $C = -\pi/2$, $D = -1$. Amplitude = $ 2 = 2$. Period stays 2π ($b = 1$, unaffected). Phase shift = $-(-\pi/2) = \text{left } \pi/2$. Vertical shift = -1 (down 1). Answer: Amplitude 2, period 2π (unchanged), phase shift left $\pi/2$, vertical shift down 1