

Algebra 2 - Graphs of Trigonometric Functions and Identities - Test Answer Key

Common Core F-TF.B.5, F-TF.C.8, F-IF.C.7e · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the test on graphs of trigonometric functions and the Pythagorean identity (F-TF.B.5). Each solution shows the full reasoning, and the scoring note explains how many points to award for correct setup, correct work, and a correct final answer. Partial credit rewards a sound method even when a small arithmetic slip changes the result.

Algebra 2 · Common Core State Standards: **F-TF.B.5, F-TF.C.8, F-IF.C.7e**

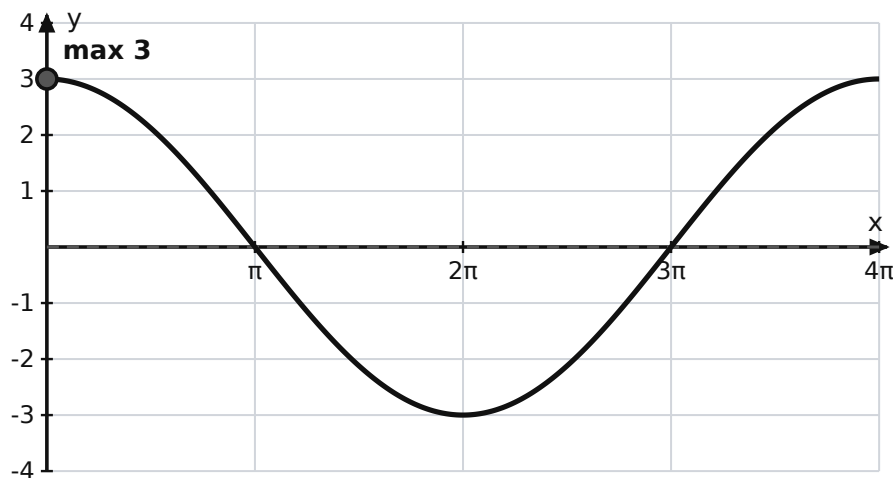
Question 1 - Read the parameters [2 pts]

Amplitude 4. Period $\frac{2\pi}{3}$. Midline $y = -2$.

4; $2\pi/3$; $y = -2$

Scoring: 1 point for the amplitude and midline, 1 point for the period.

Question 2 - Equation from a graph [3 pts]



Period 4π .

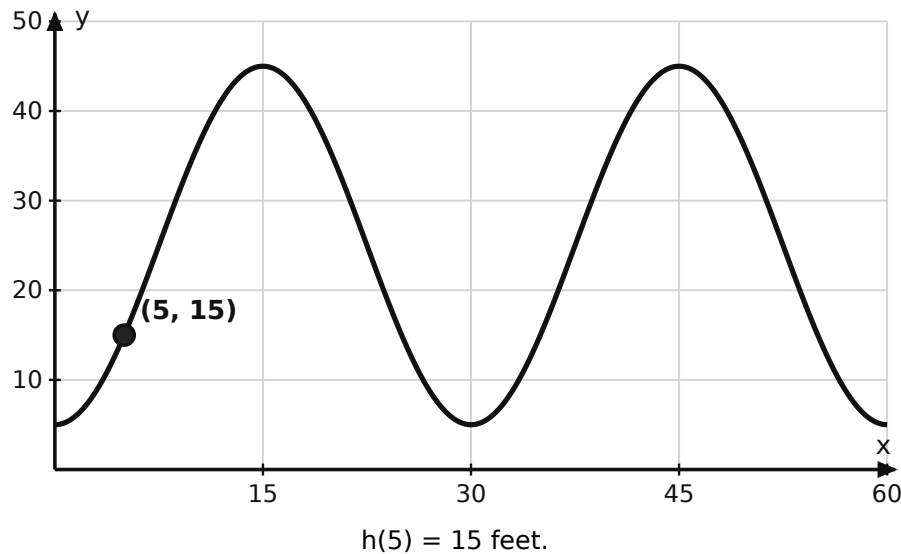
$A = 3$. Period $4\pi = \frac{2\pi}{B}$, so $B = \frac{1}{2}$.

$$y = 3\cos\left(\frac{x}{2}\right)$$

Scoring: 1 point for the amplitude, 1 point for B, 1 point for the equation.

Question 3 - Ferris wheel [2 pts]

$h(5) = 25 - 20\cos\frac{\pi}{3} = 25 - 10 = 15$. The maximum is $25 + 20 = 45$.



15 feet; maximum 45 feet

Scoring: 1 point for the height at 5 seconds, 1 point for the maximum.

Question 4 - Cosine from sine [2 pts]

$\cos^2\theta = 1 - \frac{25}{169} = \frac{144}{169}$. Negative in quadrant II.

$$\cos\theta = -\frac{12}{13}$$

Scoring: 1 point for the identity, 1 point for the sign and value.

Question 5 - Simplify [2 pts]

$$\cos^2x + \cos^2x \cdot \frac{\sin^2x}{\cos^2x} = \cos^2x + \sin^2x = 1.$$

1

Scoring: 1 point for substituting the tangent, 1 point for the result.

Question 6 - Write an equation [3 pts]

Amplitude $\frac{10-2}{2}=4$. Midline $\frac{10+2}{2}=6$. $B=\frac{2\pi}{8}=\frac{\pi}{4}$.

$$y=4\cos\left(\frac{\pi}{4}x\right)+6$$

Scoring: 1 point for the amplitude, 1 point for the midline, 1 point for B and the equation.

Question 7 - Tides [2 pts]

Period $\frac{2\pi}{\pi/6}=12$ hours. Maximum $5+3=8$.

12 hours; 8 feet

Scoring: 1 point for the period, 1 point for the maximum.

Question 8 - Quadrant IV [2 pts]

$\sin^2\theta=1-\frac{9}{25}=\frac{16}{25}$; sine is negative in quadrant IV, so $\sin\theta=-\frac{4}{5}$.

$$\tan\theta=-\frac{4}{3}.$$

$$\sin = -\frac{4}{5}, \tan = -\frac{4}{3}$$

Scoring: 1 point for the sine, 1 point for the tangent.

Question 9 - Find the error [2 pts]

Midline $y=3$, amplitude 2: maximum 5, minimum 1. She is correct.

Yes: 3 ± 2 gives 1 and 5

Scoring: 1 point for the midline and amplitude, 1 point for the conclusion.

Total**20 points**