

Calculus 1 — Quiz Review Answer Key

1. Trig Relationships

a. Given $\sin A = 5/13$ and A is in Quadrant I, find $\cos A$.

$\cos A = 12/13$. Since $\cos^2 A = 1 - 25/169 = 144/169$ and cosine is positive in Quadrant I.

b. Given $\cos B = -12/13$ and B is in Quadrant II, find $\sin B$.

$\sin B = 5/13$. Since $\sin^2 B = 1 - 144/169 = 25/169$ and sine is positive in Quadrant II.

2. Unit Circle & Reference Angles

a. $\theta = 2\pi/3$

Reference angle = $\pi/3$; $\sin \theta = \sqrt{3}/2$.

b. $\theta = 5\pi/4$

Reference angle = $\pi/4$; $\cos \theta = -\sqrt{2}/2$.

c. $\theta = 7\pi/6$

Reference angle = $\pi/6$; $\tan \theta = -\sqrt{3}/3$.

d. $\theta = 5\pi/3$

Reference angle = $\pi/3$; $\cos \theta = 1/2$.

3. Coordinates → Trig Functions

The terminal side of θ passes through the point $(5, -12)$.

$$r = 13$$

$$\sin \theta = -12/13, \quad \tan \theta = -12/5, \quad \sec \theta = 13/5$$

Quadrant IV

4. Amplitude & Period

Function	Amplitude	Period
$y = 3 \sin x$	3	2π
$y = \sin(2x)$	1	π
$y = -4 \cos x$	4	2π
$y = \cos(3x)$	1	$2\pi/3$

a. What does the negative sign in $y = -4 \cos x$ do to the graph?

It reflects the graph across the x -axis.

b. Does the 3 in $y = \cos(3x)$ change the amplitude or the period?

It changes the period (horizontal scale), not the amplitude.

5. Don't Confuse These

a. Greater amplitude: $2 \sin x$ or $\sin(2x)$

$$2 \sin x$$

b. Shorter period: $3 \cos x$ or $\cos(3x)$

$$\cos(3x)$$

6. Essential Identities

a. $\sin^2 x + \cos^2 x =$

1

b. $1 + \tan^2 x =$

$\sec^2 x$

c. $1 + \cot^2 x =$

$\csc^2 x$

d. $\sin x / \cos x =$

$\tan x$

e. $1 / \cos x =$

$\sec x$

7. Inverse Trigonometry

Evaluate exactly.

a. $\sin^{-1}(0) = 0$ b. $\sin^{-1}(\sqrt{3}/2) = \pi/3$ c. $\cos^{-1}(1/2) = \pi/3$ d. $\tan^{-1}(1) = \pi/4$

Function	Domain	Range
$y = \sin^{-1}x$	$[-1, 1]$	$[-\pi/2, \pi/2]$
$y = \cos^{-1}x$	$[-1, 1]$	$[0, \pi]$
$y = \tan^{-1}x$	$(-\infty, \infty)$	$(-\pi/2, \pi/2)$