

TRIGONOMETRY EXAM 4C

Show all work on separate paper.

Give exact values where possible. Otherwise round to nearest hundredth.

1. Find all x , $0 \leq x \leq 360^\circ$, $3 \sin^2 x - \sin x - 2 = 0$
2. Find all x , $0 \leq x \leq 2\pi^R$, $\sin^2 x + 4 \cos^2 x + 2 \sin x - 2 = 0$
3. Find all x , $0 \leq x \leq 2\pi^R$, $3 \cos x + 4 \sin x = 1$
4. Find all x , $0 \leq x \leq 2\pi^R$, $(1 - \tan^2 x) \tan 2x + 2 \sin x = 0$
5. Find all x , $0 \leq x \leq 360^\circ$, $\tan 3x = -1$
6. Find all x , $0 \leq x \leq 360^\circ$, $\cos x \tan x + \sin 2x = 0$
7. Does $\sin x = \frac{1}{2}$ have the same solution set as $x = \sin^{-1} \frac{1}{2}$, for $0 \leq x \leq 2\pi$? Explain.
8. Find all x , $0 \leq x \leq 2\pi$, $\sin 3x - \sin x = 0$

In 9-12, give Amplitude, period, phase shift and graph
 $0 \leq x \leq 2\pi$

9. $y = 2 \cos x$

10. $y = \sin 2x$

11. $y = -2 \cos \left(x + \frac{\pi}{4}\right)$

12. $y = \sin \left(2x + \frac{\pi}{2}\right)$

TRIGONOMETRY EXAM 4C Answers

1. $\sin x = -\frac{2}{3}, \sin x = 1$

$x = 90^\circ, 221.81^\circ, 318.19^\circ$

2. $\sin x = \frac{1 \pm \sqrt{7}}{3}$

$\sin x = 1.2133 \quad \sin x = -0.5486$

Nohty!

$x = 3.72^R, 5.70^R$

3. $\frac{4}{5} \sin x + \frac{3}{5} \cos x = \frac{1}{5}$

$\sin(x + \alpha) = \frac{1}{5}$

$\cos \alpha = \frac{4}{5}, \sin \alpha = \frac{3}{5}$

$\alpha = .6435^R$

$x + \alpha = 2.014, 2.9402$

$x = 2.30, 5.84$

4. $\sin x = 0, \sec x = -1$

$x = 0, \pi, 2\pi$

5. $3x = 135, 315, 675, 495, 1035, 855, 1395, 1215$

$x = 45, 105, 165, 225, 285, 345$

6. $\sin x + \sin 2x = 0$

$\sin x = 0, \cos x = -\frac{1}{2}$

$x = 0, 120, 180, 240, 360$

7. $\sin x = \frac{1}{2}, \text{Arcsin } x = \frac{1}{2}$

$x = \frac{\pi}{6}, \frac{5\pi}{6}, x = \frac{\pi}{6} \text{ only!}$

No!

8. $\sin^3 x = 3 \sin x - 4 \sin^3 x$

$3 \sin x - 4 \sin^3 x - \sin x = 0$

$2 \sin x - 4 \sin^3 x = 0$

$2 \sin x (1 - 2 \sin^2 x) = 0$

$\sin x = 0, \sin^2 x = \frac{1}{2}$

$\sin x = \pm \frac{\sqrt{2}}{2}$

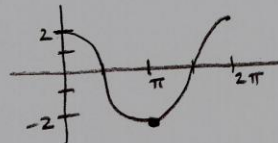
$x = 0, \pi, 2\pi, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

9. $y = 2 \cos x$

Amp = 2

Period = 2π

P.S. = 0

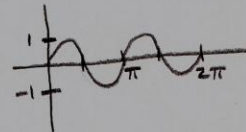


10. $y = \sin 2x$

Amp = 1

Period = π

P.S. = 0

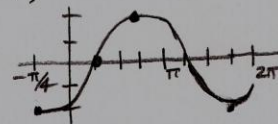


11. $y = -2 \cos(x + \frac{\pi}{4})$

Amp = -2

Period = 2π

P.S. = $-\frac{\pi}{4}$



12. $y = \sin(2x + \frac{\pi}{2})$

Amp = 1

Period = π

P.S. = $-\frac{\pi}{4}$

