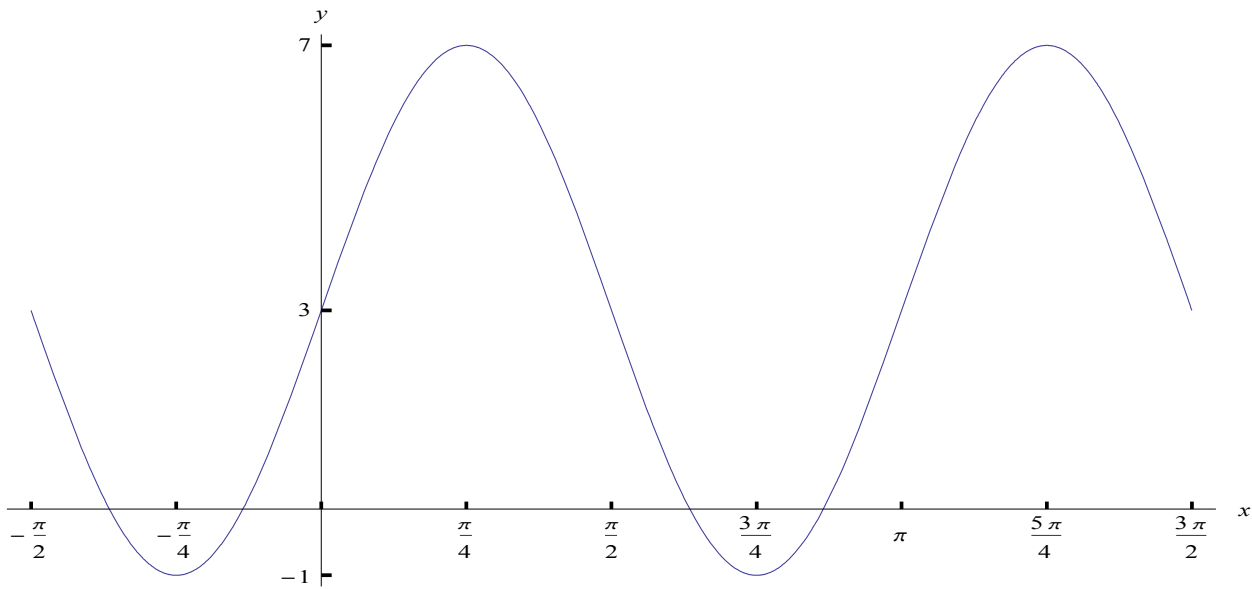


TRIGONOMETRY – PRACTICE EXAM 2 (Solutions) – Chapters 4 – 5



- 1.
2. a) 8 b) $\frac{2\pi}{7}$ c) $x \in (-\infty, \infty)$ d) $f(x) \in [9, 25]$
3. a) N/A (i.e. Tangent & co-tangent functions do NOT have an amplitude) b) $\frac{7}{3}$
 c) *All real numbers except:* $\left\{ \frac{(7\pi + 4) + 28\pi n}{6\pi}, \frac{(21\pi + 4) + 28\pi n}{6\pi} \right\}; n \text{ is an integer}$ d) $w \in (-\infty, \infty)$
4. a) 17 in b) -17 in c) $\frac{1}{6}$ second d) 6 Hz
5. a) 1 b) $-\csc^2\theta$
6. a)
$$\begin{aligned} LHS &= \sin^2\theta(1 + \cot^2\theta) - 1 = \sin^2\theta + \sin^2\theta \cot^2\theta - 1 = \sin^2\theta + \sin^2\theta \left(\frac{\cos^2\theta}{\sin^2\theta} \right) - 1 \\ &= \sin^2\theta + \cos^2\theta - 1 = 1 - 1 = 0 = RHS \quad \text{--- DONE!} \end{aligned}$$
- b)
$$LHS = \frac{\cos \alpha}{\sin \alpha \cot \alpha} = \frac{\cos \alpha}{\sin \alpha \left(\frac{\cos \alpha}{\sin \alpha} \right)} = \frac{\cos \alpha}{\cos \alpha} = 1 = RHS \quad \text{--- DONE!}$$
7. a) $\frac{\sqrt{2} + \sqrt{6}}{4}$ b) 0
8. a) $2 - \sqrt{3}$ b) $-\frac{\sqrt{3}}{2}$
9. a) $-\frac{8\sqrt{33}}{49}$ b) $\frac{\sqrt{42}}{14}$
10. a) $-\frac{\sqrt{2 - \sqrt{2}}}{2}$ b) $\sqrt{3} - 2$

BONUS:

(B1) (use method in notes & look at example sketch)

key points: $(0, -2), \left(\frac{\pi}{12}, -5\right), \left(\frac{\pi}{6}, -8\right)$

Asymptotes: $t = -\frac{\pi}{12}, t = \frac{\pi}{4}$

(B2) (use method in notes & look at example sketch)

key points: $\left(\frac{5\pi}{4}, \frac{5}{2}\right), \left(\frac{15\pi}{4}, -\frac{5}{2}\right), \left(\frac{25\pi}{4}, \frac{5}{2}\right)$

Asymptotes: $v = \frac{5\pi}{2}, v = 5\pi$

(B3) a) odd b) even c) neither even nor odd