

Midterm Examination 3 Review

MTH 13 Section E01

Exam Date: 4 May 2017

1. Draw the graph of $y = 3 \cos x$ where $0 \leq x \leq 2\pi$. Indicate both x - and y -coordinates of the points where the y value is in its maximum and minimum.

2. What is the period and the amplitude of the function $y = \frac{1}{4} \cos \frac{\pi}{4}x$?

3. Determine the amplitude, the period, and the phase-shift of the function $y = 2 \sin(x - \frac{\pi}{3})$ and graph it.

4. Graph one cycle of $y = \tan x$, $-\frac{\pi}{2} < x < \frac{\pi}{2}$.

5. Prove the following identity:

$$\frac{1 - \sin x}{\sin x \cot x} = \frac{\cos x}{1 + \sin x}.$$

6. Recall that $\sin 45^\circ = \frac{\sqrt{2}}{2} = \cos 45^\circ$, $\sin 30^\circ = \frac{1}{2}$, and $\cos 30^\circ = \frac{\sqrt{3}}{2}$. What is the exact value of $\cos 15^\circ$?

7. Simplify the following expression:

$$\frac{\cos 3x}{\sin x} - \frac{\sin 3x}{\cos x}.$$

8. Simplify the following expression:

$$\cos \frac{x}{2} = \frac{\sin x}{2 \sin \frac{x}{2}}$$

9. Solve the equation: $\cos \frac{x}{2} = 1 + \cos x$, ($0 \leq x < 2\pi$).

10. What is the value of $\cos^{-1}(\cos 5\pi)$?