

M\$6 Exam 4 is on Wednesday, May 6, 2009

Topics:

- Solving first-degree trig equations
- Solving quadratic trig equations
- Solving quadratic trig equations involving more than one trig function
- Finding all trig functions if one trig function is known
- Sum and difference formulas for cos, sin, and tan
- Double angle and half angle formulas for cos, sin, and tan
- Proving trig identities with double angles

Calculators are required for this exam.

M\$6 Homework 41

In 1 – 3, solve for x to the nearest degree if $0^\circ \leq x < 360^\circ$.

1. $3 \cos x - \sqrt{3} = \cos x$

2. a. $\cot x = \frac{1}{5}$ b. $\csc x = \frac{1}{5}$ c. $\sec x = \frac{1}{5}$
d. $\tan x = \frac{1}{5}$ e. $\csc x = 5$ f. $\sec x = 5$

3. $\sin x - 3 = -\csc x$

In 4 – 5, solve for θ to the nearest tenth of a degree if $0^\circ \leq x < 360^\circ$.

4. $4 \cos^2 \theta - 5 \sin \theta - 5 = 0$

5. $3 \sec^2 \theta - 7 \tan \theta = 1$

6. If $\csc \theta = -\frac{5}{4}$ and $\tan \theta > 0$, then find the value of $\cos \theta$.

7. If $\cos A = -\frac{\sqrt{7}}{3}$ and angle A does *not* terminate in Quadrant II, find the exact values of the remaining five trigonometric functions.

8. If $\sin A = -\frac{3}{5}$, $\cos B = -\frac{5}{13}$, and angles A and B are in Quadrant III, find $\cos(A - B)$.

9. If $\cos x = \frac{1}{8}$ where x is an acute angle, find the value of a) $\cos \frac{x}{2}$ b) $\cos 2x$ c) $\sin 2x$ d) $\tan \frac{x}{2}$

10. If $\sin x = -\frac{\sqrt{5}}{4}$ and $\cos x > 0$, find the exact value of $\tan 2x$.

11. Find the exact value of $\tan 15^\circ$.

12. Prove that $\frac{\sin 2\theta}{1 + \cos 2\theta} = \tan \theta$.

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$\sin(A + B) = \sin A \cos B + \cos A \sin A$$

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

$$\sin 2A = 2 \sin A \cos A$$

$$\cos 2A = \cos^2 A - \sin^2 A$$

$$\cos 2A = 1 - 2 \sin^2 A$$

$$\cos 2A = 2 \cos^2 A - 1$$

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$\cos \frac{1}{2} A = \pm \sqrt{\frac{1 + \cos A}{2}}$$

$$\sin \frac{1}{2} A = \pm \sqrt{\frac{1 - \cos A}{2}}$$

$$\tan \frac{1}{2} A = \pm \sqrt{\frac{1 - \cos A}{1 + \cos A}}$$