

EXAM 3
Math 117
December 4, 2009

Name _____

You must show all your work. Partial credit will be given.

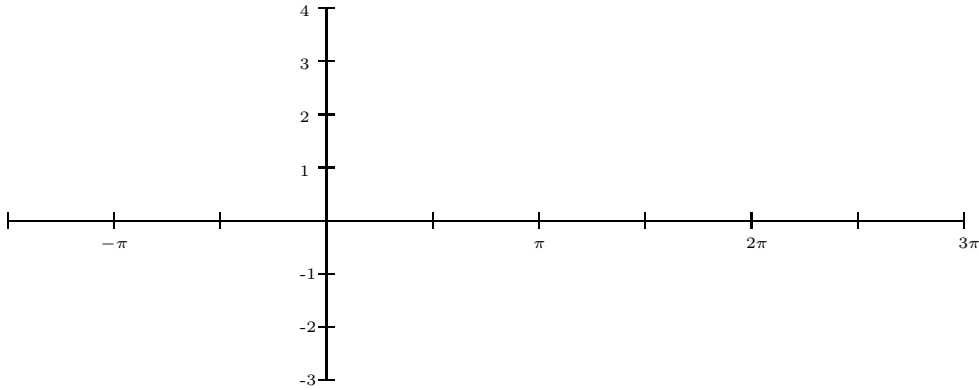
1. Find an angle, in radian measure, which is coterminal with $\frac{45\pi}{8}$ and which is between 0 and 2π .

2. Factor the equation $3 \tan^2(\theta) + 5 \tan(\theta) - 2$.

3. Assume that $\cos(\theta) = -2/5$ and that $\pi \leq \theta \leq \frac{3\pi}{2}$. Find $\tan(\theta)$, $\csc(\theta)$, and $\tan(4\pi - \theta)$.

4. Find the amplitude, period and phase shift for the function $p(t) = 3 \cos(2t - \pi)$.

Now sketch a graph of the function on the axis below.



5. For each of the following equations, determine whether they are true identities.

(a) $\sin(x) \tan(x) + \cos(x) = \sec(x)$.

(b) $\frac{\tan(x) + \sin(x)}{1 + \cos(x)} = \tan(x)$

(c) $\frac{\sin(x+y)}{\sin(x)\cos(y)} = 1 + \cot(x)\tan(y)$

6. Assume that $\sin(\theta) = .6$ and that $0 \leq \theta \leq \pi/2$. Evaluate $\sin(4\theta)$ and $\cos(2\theta)$.

7. Find the value of the following quantities manually. (you must show your intermediate steps.)

(a) $\cos^{-1} \sin\left(\frac{4\pi}{3}\right)$

(b) $\sin\left(\tan^{-1}\left(\frac{\sqrt{5}}{10}\right)\right)$.

8. Solve each of the following equations.

(a) $\sin(x) = .465$

(b) $\cos^2(x) + 5 \cos(x) = 1$

9. A rocket is fired straight up. The line of sight from an observer 4 miles away makes an angle at θ radians with the horizontal. Express θ as a function of the height h of the rocket. Use your function to calculate θ when the height is 1.5 miles. When $\theta = \frac{\pi}{3}$ radians what is the height of the rocket?