

Ninth Quiz for Math 30, section 6432

Directions: You should fully justify your answers. Do all your work on separate paper, and make sure to *print* your name in the first sheet and staple all the sheets together. **Unstapled, loose pieces of paper will not be graded.** This quiz is due Wednesday May 14, at 6:00 PM.

1. Find:

(a) $\sin(\cos^{-1}(0.3))$

(b) $\tan\left(\sin^{-1}\left(-\frac{4}{5}\right)\right)$

(c) $\cos^{-1}\left(\cos\left(\frac{13\pi}{12}\right)\right)$

(d) $\sin^{-1}\left(\sin\left(\frac{13\pi}{8}\right)\right)$

(e) $\sin^{-1}\left(\sin\left(\frac{37\pi}{9}\right)\right)$

2. Verify the identities:

(a) $\frac{1}{\tan^2 a + 1} = \cos^2 a$

(b) $3 + \cot^2 x = 2 + \csc^2 x$

(c) $\frac{\cos \theta \cot \theta}{1 - \sin \theta} - 1 = \csc \theta$

(d) $\frac{\sec x - \csc x}{\sec x + \csc x} = \frac{\tan x - 1}{\tan x + 1}$

3. Use the sum and difference formulas to find all trigonometric numbers for an angle of 75° .

4. Use the sum and difference formulas for sin and cos to verify the following identities:

(a) $\cos\left(\frac{\pi}{2} - \phi\right) = \sin \phi$

(b) $\sin\left(\frac{\pi}{2} - \phi\right) = \cos \phi$

(c) $\sin(\pi - x) = \sin x$

(d) $\cos(\pi - x) = -\cos x$

(e) $-2 \cos\left(x - \frac{5\pi}{4}\right) = (\sin x + \cos x)\sqrt{2}$

(f) $\tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$

5. Find *all* solutions of the following equations:

(a) $\cos x = -\frac{1}{3}$

(b) $\sin 2x = \frac{\sqrt{2}}{2}$

(c) $\sin x = \cos x$

(d) $2 \cos^2 x + 3 \cos x + 1 = 0$

(e) $-2 \cos^2 x + 1 = \sin x$