

Chapter 3 Review**1) Determine if the statement is true or false. State the property used.**

a) $\cos^2 \theta + \sin^2 \theta = 1$

f) $\sec(18^\circ) = \csc(18^\circ)$

b) $\cos(x - y) = \cos x \cos y - \sin x \sin y$

g) $\csc x = \frac{1}{\sec x}$

c) $\csc^2 \theta + 1 = \sec^2 \theta$

h) $\frac{\sin(2x)}{2 \sin x} = \cos x$

d) $\cot(15^\circ) = \tan(75^\circ)$

i) $\tan x = \frac{\sin x}{\cos x}$

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

j) $\sin(x + y) = \sin x + \sin y$

2) Find the exact values of the following using sum and difference formulas.

a) $\sin(15^\circ)$

b) $\cos(165^\circ)$

c) $\tan(15^\circ)$

d) $\cos(75^\circ)$

3) If $\sin A = \frac{10}{13}$ and A is in Quadrant II, find the exact values of the following:**(Do your preliminary work first, i.e., determine $\cos A$.)**

a) $\sin(2A)$

b) $\cos(2A)$

c) $\tan(2A)$ (use parts a) and b) to determine the value)

4) Verify the double argument property by substituting 90° for A.

a) $\sin(2A) = 2 \sin A \cos A$

b) $\cos(2A) = \cos^2 A - \sin^2 A$

5) Prove the following identities.

a) $\sin^2 x - \cos^2 x = 2 \sin^2 x - 1$

b) $\sin(2x) = \frac{2 \cot x}{1 + \cot^2 x}$

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

d) $\tan^2 x + \csc^2 x = \cot^2 x + \sec^2 x$

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