

PRE-CALCULUS 12

REVIEW OF SUM AND DIFFERENCE and DOUBLE ANGLE IDENTITIES

1. **Simplify:**

a. $\sin^2(2.5) + \cos^2(2.5)$

b. $\cos(-\theta)\sec(-\theta) - \csc(\theta)\sin(-\theta)$

c. $\sin 160^\circ \cos 20^\circ + \cos 160^\circ \sin 20^\circ$

d. $\frac{\sin 4\theta}{2\sin 2\theta}$

e. $\sin\theta \csc\theta + \frac{\sin\theta}{\cos\theta \cot\theta}$

2. **Use identities to simplify:**

a. $1 - 2\sin^2(1.5)$

b. $\sin(0.8)\cos(0.8)$

c. $2\sin^2(0.75) - 1$

3. If θ is a 2nd quadrant angle with $\sin\theta = \frac{4}{5}$ and β is a 3rd quadrant angle with $\sec\beta = -\frac{13}{5}$, determine:

a. $\sin(2\beta)$

b. $\cos(\theta + \pi)$

c. $\sin(\beta - \theta)$

4. **Prove**

a. $\cos\theta + \sin\theta = \frac{\cos 2\theta}{\cos\theta - \sin\theta}$

b. $\sin 2A = \frac{2 \tan A}{1 + \tan^2 A}$

c. $\sin 3\theta = 3\sin\theta \cos^2\theta - \sin^3\theta$

d. $\frac{2 \tan x}{1 - \tan^2 x} = \tan 2x$