MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 3.6 **Math 1090 Worksheet** FALL 2009

For practise only. Not to be submitted.

1. Use the sum, difference, double- or half-angle formulas to find the exact value of the each of the following.

   (a) $\sin(315°)$ (b) $\cos\left(\frac{17\pi}{12}\right)$ (c) $\cos\left(\frac{3\pi}{8}\right)$

2. If $\tan(\alpha) = \frac{3}{4}$ for α in the third quadrant, and $\sin(\beta) = -\frac{5}{13}$ for β in the fourth quadrant, find each of the following.

   (a) $\sin(\alpha+\beta)$ (b) $\sin(\alpha-\beta)$ (c) $\cos(\alpha+\beta)$
   (d) $\cos(\alpha-\beta)$ (e) $\cos\left(\alpha+\frac{\pi}{3}\right)$ (f) $\sin(2\alpha)$
   (g) $\cos(2\alpha)$ (h) $\sin(\frac{1}{2}\beta)$ (i) $\cos(\frac{1}{2}\beta)$

3. Using the information derived in #2(a)–(d), identify the quadrant in which the following angles can be found.

   (a) $\alpha+\beta$ (b) $\alpha-\beta$

4. Verify each of the following trigonometric identities.

   (a) $\frac{\cos(\alpha+\beta)}{\cos(\alpha-\beta)} = \frac{1-\tan(\alpha)\tan(\beta)}{1+\tan(\alpha)\tan(\beta)}$ (b) $\cos^2\left(\frac{x}{2}\right) = \frac{\sec(x)+1}{2\sec(x)}$

   (c) $\sin(2t) - \tan(t) = \tan(t)\cos(2t)$

5. Find all solutions of the following equations, such that $0 \le x < 2\pi$.

   (a) $\sin(x) = 1 - \cos(2x)$ (b) $\sin(2x) + 2\cos^2(x) = 0$