Precalculs Exam # 3 Version 1

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We assume that $\pi = 3.1415926.....$

1. (25) Suppose $\sin x = \frac{1}{2}$ and $\cos y = \frac{\sqrt{2}}{2}$. Both are in the first quadrant. Compute

   - $\cos x$, $\sin y$.

   - $\sin(x - y)$.

   - $\cos(x + y)$.

   - $\cos(x - y)$.

   - $\tan(x - y)$.

2. (25) Suppose $\tan x = -\frac{3}{4}$ and x is in the third quadrant.

   - Which quadrant is $\frac{x}{2}$ in?

   - compute $\cos x$.

   - compute $\sin \frac{x}{2}$.

   - compute $\cos \frac{x}{2}$.

   - compute $\cos 2x$.

3. (10) Suppose $\sin \frac{\pi}{6} = \frac{1}{2}$. Solve the equation $\sin \theta = \frac{1}{2}$ (there are two sets of solutions).

4. (10) Solve $2\sin^2 x + \cos x = 1$, $0 \leq x \leq \pi$.

5. (40) Solve the following two triangles (You are allowed to express your solutions in terms of trig functions).

   - $A = \frac{\pi}{6}, B = \frac{\pi}{4}, c = 1$. Find C, a, b.

   - $B = \frac{\pi}{6}, a = \sqrt{3}, b = 1$. Find A, C, c (There are two sets of solutions).