(Blitzer, chapters 5 and 6)

1. Verify the following trigonometric identities:

   a. $\dfrac{\tan\theta + \cot\theta}{\sec\theta} = \csc\theta$ (10)

   b. $\cos^4\theta - \sin^4\theta = 1 - 2\sin^2\theta$ (10)

   c. $\dfrac{\sin(\alpha+\beta)}{\cos\alpha\cos\beta} = \tan\alpha + \tan\beta$ (10)

2. Find the exact value of $\cos(45° - 30°)$. (10)

3. Solve: (10)

   $2\sin^2 x - 3\sin x - 2 = 0, \qquad 0 \le x < 2\pi$

4. Solve each triangle (express angles to nearest degree and length to nearest tenth).

   a. $a = 5,\ b = 7,\ C = 42°$ (10)

   b. $A = 44°,\ B = 25°,\ a = 12$ (10)

5. Convert the equation to polar coordinates: (5)

   $3x + y = 7$

6. Convert the equation to Cartesian coordinates: (5)

   $r = 6\cos\theta + 4\sin\theta$

7. Find all fifth roots of 32. Express the values rounded to the nearest tenth. (20)

8. Sketch the graph for:

   $r = 1 - \sin\theta.$ (10)