

**Advanced Math**  
**Problem Solving #3**  
**Due Friday April 30<sup>th</sup>**

1. Complete the following identities

$$\sin(A \pm B) =$$

$$\cos(A \pm B) =$$

$$\sin(2\theta) =$$

$$\cos(2\theta) =$$

2. Solve  $\cos^2 \theta + \cos \theta = 2$

3. Determine what values for  $w$  satisfy the inequality  $\frac{2}{w} + 3 > \frac{29}{w}$

4. The Gilbert School district is growing exponentially at an approximate rate of 3% per year. If the district has 1100 students in January of 2010, approximately how many years will it take for the district to double their student population?

5. It takes a painter 1 hour to prepare a room to be painted. The painter's apprentice can prepare the same room in 1.5 hours. How long would it take the painter and the apprentice working together to prepare the room?

6. Simplify the expression  $\frac{x - \frac{3}{2x-1}}{1 - \frac{2}{2x-1}}$ .

7. How many 3-digit numbers exist that have repeated digits?