Worksheet #6 - Review

1. Write each of the following expressions as complex numbers in the form $a + bi$:
   (a) $\sqrt{-9} + \sqrt{36}$
   
   (b) $\frac{4+\sqrt{-40}}{2}$

2. Simplify the expression $(5 - 3i)(4 + 3i)$ completely.

3. Use the quadratic formula to find the solutions of the equation $2x^2 + 2x = -13$, and write the solutions in the form $a \pm bi$. 
4. Find the maximum area of a rectangular garden that can be enclosed by 100 feet of fence. Show all work.

5. Sixty-five miles per hour is how many feet per second?

6. The cost of attending a concert varies directly with the number of tickets purchased. Suppose 9 tickets can be bought for 351 dollars. Let \( x \) be the number of tickets purchased and let \( y \) be the dollars spent. Write an equation that relates \( x \) and \( y \), and determine the value of the constant of variation.

constant of variation: ________________
The number of years the world resources of silver will last varies inversely with the number of metric tons used per year. Estimated world supply in 2001 was 430,000 metric tons. Let \( y \) be years and \( x \) be metric tons used per year. Write a formula that relates \( x \) and \( y \). What is the constant of variation? And how long will reserves last if we use 2,000 metric tons of silver each year?

Equation: 

Constant of variation: 

Years left at 2,000 metric tons used per year: 

Simplify the expression \( \frac{x^2 + x - 2}{x^2 + 5x + 6} \) and state any restrictions on the variable \( x \).

Restrictions: 