Sample Questions for Exam # 2

1. Solve the equation $x^2 + 12x + 4 = 0$ using the quadratic formula. (Section 7.4)

2. Solve the equation $3w^2 - 8w = 5$ using the quadratic formula. (Section 7.4)

3. Find the vertex of the parabola $y = -5x^2 + 10x + 6$. (Section 7.5)
4. Construct a quadratic equation that passes through the points (3, 0), (7, 0) and (4, 2). *(Section 7.5)*

5. The profit of a company is \( P(x) = -160x^2 + 8,000x - 39160 \) dollars, where \( x \) is the number of units sold. Determine the break-even values and the maximum possible profit. *(Section 7.5)*

6. One square has a side length of \( x \), and a larger square has a side length of \( x + 2 \). If the total area of these two squares combined is 20 \( \text{in}^2 \), find the value of \( x \). *(Section 7.6)*

7. Find two consecutive integers whose product is 240. *(Section 7.6)*
8. Upon leaving an airport, an airplane flew due south and then due east. After it had flown 17 miles farther east than it had flown south, it was 25 miles from the airport. How many miles south had it flown? (Section 7.6)

9. Find all the solutions of the equation \( x^2 - 4x + 29 = 0 \). (Section 7.7)

10. Construct a quadratic equation that has the solutions \( 4i \) and \(-4i\). Write your equation in the form \( ax^2 + bx + c = 0 \). (Section 7.7)
11. Simplify the expression \((5 - 4i)^2 - (3 + i(2 - i))\). Write your answer in the form \(a + bi\).  
(Section 7.7)

12. Simplify the expression \(\frac{6}{2 + 3i}\). Write your answer in the form \(a + bi\).  
(Section 7.7)

13. Evaluate the function \(f(x) = \frac{2x+1}{x-3}\) at the point \(x = 5\). And what is the domain of this function?  
(Section 8.1)

14. Reduce the expression \(\frac{4w-5z}{5z-4w}\) to lowest terms.  
(Section 8.1)

15. Reduce the expression \(\frac{x^2-16}{x^2-6x+8}\) to lowest terms.  
(Section 8.1)
16 Reduce the expression \( \frac{x+1}{x^2-4x+4} \cdot \frac{x^2-2x}{x^2-1} \) to lowest terms. (Section 8.2)

17 Reduce the expression \( \frac{4x+16}{x^2-4x+4} \cdot \frac{x^2-x}{x^2+8x+19} \) to lowest terms. (Section 8.2)

18 Reduce the expression \( \frac{4}{x^2-4x+4} - \frac{2}{x^2-4} \) to lowest terms. (Section 8.3)
19. Reduce the expression \( \frac{1}{x^2-36} + \frac{2}{x^2+13x+42} \) to lowest terms. \((Section 8.3)\)

20. Solve the equation \( \frac{2}{x} + \frac{3}{x+1} = 1 \). \((Section 8.5)\)

21. Solve the equation \( \frac{1}{t^2-1} = 2 + \frac{3}{t^2+2t+1} \). \((Section 8.5)\)