Sample Questions for Final Exam

1. Simplify the expression $\frac{4}{x+2} - \frac{2}{x+1}$. (Section 7.6)

2. Simplify the expression $\frac{1}{1-x} + \frac{x^2}{x-1}$. (Section 7.6)

3. Solve the equation $\frac{1}{x+1} + \frac{1}{x} = 1$. (Section 7.7)

4. Simplify the expression $(x^{-1}y^3)(x^3y^{-2})$. (Section 8.1)
5 Simplify the expression $\frac{x^2}{\sqrt{x}}$. (Section 8.3)

6 Simplify the expression $(\frac{\sqrt{x^2 - 99}}{x^2 - 18x})^0$. (Section 8.1)

7 Simplify the expression $\sqrt{48} - \sqrt{12}$. (Section 8.5)

8 Show that $x = 1 - \sqrt{3}$ satisfies $x^2 - 2x - 2 = 0$. (Section 8.5)

9 Solve the equation $\sqrt{5x - 1} = 2$, and check your answer. (Section 8.7)
10 Use the quadratic formula to find the solutions of the equation $2x^2 + 2x = -1$ and simplify the answers. (Section 6.2)

11 Find the coordinates of the vertex of the parabola $y = x^2 - 2x - 1$. (Section 5.3)

12 When a small company sells $x$ MP3 players, it’s total profit in dollars is $y = 500x - 5x^2$. How many MP3 players should the company sell to get the maximum profit? (Section 6.4)

13 Sixty miles per hour is how many feet per second? (Hint: There are 5280 feet in each mile.) (Section 7.1)

14 Simplify the expression $\frac{ab+b}{a^2+a}$, and state any restrictions on the variables $a$ and $b$. (Section 7.4)
15. Is the function $f(x) = 3x(1 - x)$ linear, quadratic, or neither? (Section 4.1)

16. What are the $x$-intercepts of the equation $y = (2x + 1)(4 - x)$? (Section 4.5)

17. Find the equation of a line that goes through the points $(-1, 2)$ and $(2, 0)$. (Section 2.4)

18. Find the equation of a line through the point $(1, 2)$ that is parallel to the line $x + y = 1$. (Section 2.5)
19. A popular company rents moving trucks for $29 plus 99 cents per mile driven. Write down a function that describes the cost in dollars of renting a truck and driving it for $x$ miles. (*Section 2.4*)

20. If $y$ varies inversely with $x$ and $y = 2$ when $x = 5$, find an equation for $y$ in terms of $x$. (*Section 7.3*)

21. Simplify the expression \( \frac{x^2 + 2x + 1}{x^2 - 1} \div \frac{x + 2}{x - 1} \) completely, and state any restrictions on the variable. (*Section 7.4*)

22. Solve the equation $\sqrt{3x - 5} = 4$, and find any restrictions on the variable. (*Section 8.7*)