MATH 153 Test 1

1. Rewrite the expression without using the absolute value symbol, and simplify the result. $|3 + x|$ if $x < -3$.

2. Simplify $(5x^2y^{-3})(4x^{-5}y^4)$.

3. Factor $64x^3 - y^6$.

4. Factor $y^2 + 9 - 6y - 4x^2$.

5. Simplify the expression $\frac{1}{x} - \frac{2}{x^2 + x} - \frac{3}{x + 3}$.

6. Rationalize the denominator $\frac{16x^2 - y^2}{4\sqrt{x - \sqrt{y}}}$.

7. Solve the equation $\frac{3\sqrt{5}x}{5} = \frac{4x}{5}$.

8. Solve the equation $\frac{5}{2x + 3} + \frac{1}{2x - 3} = \frac{14x + 3}{4x^2 - 9}$.

9. A boy can row a boat at a constant rate of 5 mi/hr in still water. He rows upstream for 15 minutes and then rows downstream, returning to his starting point in another 12 minutes. Find the rate of the current.

10. A chemist has 10 milliliters of a solution that contains a 30% concentration of acid. How many milliliters of pure acid must be added in order to increase the concentration to 50%?