EXAM 4 - MATH 102 Friday, November 22

YOUR NAME:_____ George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Perform the following operations and simplify:

   (a) $2\sqrt[3]{24} + \sqrt[3]{81} =$

   (b) $(5\sqrt{7} - 3)^2 =$

   (c) Rationalize the denominator and simplify
   $$\frac{\sqrt{6}}{4\sqrt{3} + \sqrt{2}} =$$

2. Simplify the expressions:

   (a) $\sqrt[3]{\dfrac{a^6 b}{27c^{12}}} =$

   (b) $\left(\dfrac{2x^{1/3}}{x^{-3/4}}\right)^3 =$

3. Solve the equation $\sqrt{2x^2 + x - 12} = x$.

4. Two positive numbers x and y differ by 11, and their square roots differ by 1.

   (a) Write two equations that express the conditions in the statement above.

   (b) Solve the system of equations to find the numbers x and y.

5. Solve the radical equation $\sqrt{x + 9} + \sqrt{x - 3} = 6$.