MA 153 Exam 1 Spring 2001

Name: _____

Circle your answer to problems 1-3. You must show work to receive credit.

(8 pts.) 1. Rewrite as a single polynomial:

$$\left(6x^3 - 2x^2 + x - 2\right) - 4\left(x^2 - 3x + 1\right)$$

A. $6x^3 - 6x^2 + 13x - 6$

B. $6x^3 + 2x^2 - 11x + 2$

C. $6x^3 - 6x^2 + 13x + 2$

D. $6x^3 + 2x^2 - 11x - 6$

E. None of the above

(8 pts.) 2. Simplify and eliminate negative exponents:

$$\left(\frac{-2r^3t^{-4}z^0}{r^{-1}t^0}\right)^{-3}$$

A. $\dfrac{t^{12}}{8r^{12}}$

B. $-\dfrac{t^{12}}{8r^6}$

C. $\dfrac{8t^{12}}{r^6}$

D. $-\dfrac{8t^{12}}{r^{12}}$

E. None of the above

(8 pts.) 3. Perform the given operation and simplify completely.

$$\frac{3x}{x+3} - \frac{5}{x+2}$$

A. $3x^2 + x - 15$

B. $\dfrac{3x-5}{(x+3)(x+2)}$

C. $3x^2 + x + 3$

D. $\dfrac{3x^2 + x - 15}{(x+3)(x+2)}$

E. $\dfrac{3x^2 + x + 3}{(x+3)(x+2)}$

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(8 pts.) 4. The volume of a right circular cone is given as $V = \frac{1}{3}\pi r^2 h$.
Solve the equation for *h*. Simplify your answer completely.

(8 pts.) 5. Rationalize the denominator and simplify completely. Express the numerator as a single polynomial (leave no parentheses in your final answer).

$$\frac{\sqrt{x}+5}{\sqrt{x}-6}$$

(16 pts.) 6. Solve each of the following equations for the variable.

(6 pts.) a) $7(3x-5)-4(x+3)=4$

(10 pts.) b) $\frac{2}{x-6}-\frac{3}{3x+5}=\frac{23}{3x^2-13x-30}$

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(12 pts.) 7. Factor each of the following polynomials completely.

(6 pts.) a. $x^3 - 64x$

(6 pts.) b. $6x^2 + x - 12$

(10 pts.) 8. Perform the given operation and simplify completely.

$$\frac{6x^2 - 19x + 10}{4x^2 - x - 3} \div \frac{2x - 5}{4x^2 + 3x}$$

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(10 pts.) 9. Jimmy has test scores of 75, 80, 82, and 85. What does he need to score on the next test to raise his test average to exactly 83? Name the variable, set up an equation and solve.

(12 pts.) 10. Traveling with a 7 mph current, it takes a boat 2.5 hours to go downstream from point A to point B. The boat turns around and, against the same current, completes the return trip upstream in 3.5 hours. What is the speed of the boat in still water? Name the variable, set up an equation and solve.