

Name: _____

Place your answers in the spaces provided. You must show correct work to receive credit.

(8 pts) 1. Multiply and simplify completely:

$$(x + 2)(x^2 - 3x + 4)$$

(8 pts) 2. Find the quotient and the remainder if $x^2 - 3x + 1$ is divided by $x + 3$.

quotient:

remainder:

(8 pts) 3. Simplify completely. Assume all variables represent positive real numbers.

$$\sqrt{50a^{12}b^{19}}$$

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(10 pts) 4. Multiply and simplify completely.

$$\frac{x^2 - 25}{x^2 - 7x + 10} \cdot \frac{x^4 - 5x^3}{x^3 + 5x^2}$$

(16 pts) 5. Solve the following equations. Check your answer(s).

(6 pts) (a) $\sqrt{y+6} + 3 = 7$

y =

(10 pts) (b) $\frac{2}{x+3} - \frac{3}{x} = \frac{8x}{x(x+3)}$

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 $x =$ Place your answers in the spaces provided. You must show correct work to receive credit.

(10 pts) 6. Add and simplify.

$$\frac{3a}{a-3} + 2$$

(14 pts) 7. Factor each of the following completely.

(6 pts) (a) $2x^4 + x^3 - 6x^2$

(8 pts) (b) $ac^2 - 25a + 2bc^2 - 50b$

(6 pts) 8. Simplify completely. Do not leave negative exponents in your answer. Leave your answer with rational exponents.

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$$x^{\frac{1}{3}} x^{-\frac{1}{2}} y^{\frac{2}{5}}$$

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- (10 pts) 9. A tank can be filled by hose A alone in 18 hours. When hose A and hose B work together, the tank is filled in 8 hours. How long would it take hose B to fill the tank alone?
(Name a variable, set up an equation, and solve.)

- (10 pts) 10. If each of the sides of a square is lengthened by 3 feet, the area becomes 64 square feet. Find the length of a side of the original square. (Draw and label pictures, set up an equation, and solve.)

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Original length =