

Math 172–Assignment # 5

Name: _____

1. State the domain of the following rational expression in both interval notation and set-builder notation.

$$\frac{2x+1}{x^3-4x}$$

2. Perform the indicated operations and simplify, using positive exponents.

a) $\frac{d^2-9}{10d^3} \div \frac{6-2d}{5d}$

b) $\frac{\frac{5}{x-2} - \frac{4}{x+2}}{\frac{5}{x^2-4} - 1}$

$$c) \frac{3}{a-1} - \frac{2}{a-2}$$

$$d) 2m^{-2} + mn^{-1}$$

$$e) \frac{5}{x-2} + \frac{1}{x} + \frac{2}{x^2-2x}$$

$$f) \frac{k^2+2k-15}{k^2-4k+3} \cdot \frac{k^2+k-20}{k-k^2}$$

$$g) \frac{10y^x-5}{y^{2x}-2y^x} \cdot \frac{2y^{2x}+7y^x-4}{y^{2x}+2y^x-8}$$

3. Find the quotient and the remainder.

$$(x^3-x^2-10x-8) \div (x-4)$$

Quotient: _____

Remainder: _____

4. Rewrite $\frac{2x}{x-3}$ in the form quotient + $\frac{\text{remainder}}{\text{divisor}}$

5. Use division to determine whether $x^2 - 2$ is a factor of $2x^4 + x^3 - 2x - 10$.
Explain your reasoning.

6. Solve the following equations.

a) $\frac{7}{x} = \frac{x}{7}$

$$\text{b) } \frac{3}{y-2} + \frac{2y}{4-y^2} = \frac{5}{y+2}$$

$$\text{c) } \frac{x}{x+5} + \frac{5}{x} = \frac{25}{x^2+5x}$$

7. Solve the following equation for P :

$$t = \frac{A-P}{Pr}$$

8. It takes a small pump 5 minutes longer than a large pump to pump up an inflatable boat. If both pumps are working together, they can pump up the boat in only 6 minutes. How long does it take each pump working by itself?