Name: ____ Date: ___________________________

BLM 3–4

Section 3.2 Extra Practice

1. Use long division to divide $x^2 - x - 15$ by $x - 4$.

a) Express the result in the form $\frac{P(x)}{x-a} = Q(x) + \frac{R}{x-a}$.

b) Identify any restrictions on the variable.

c) Write the corresponding statement that can be used to check the division.

d) Verify your answer.

2. Divide the polynomial $P(x) = x^4 - 3x^3 + 2x^2 + 55x - 11$ by $x + 3$.

a) Express the result in the form $\frac{P(x)}{x-a} = Q(x) + \frac{R}{x-a}$.

b) Identify any restrictions on the variable.

c) Verify your answer.

3. Determine each quotient using long division.

a) $(3x^2 - 13x - 2) \div (x - 4)$

b) $\frac{2x^3 - 10x^2 - 15x - 20}{x + 5}$

c) $(2w^4 + 3w^3 - 5w^2 + 2w - 27) \div (w + 3)$

4. Determine each remainder using long division.

a) $(3w^3 - 5w^2 + 2w - 27) \div (w - 5)$

b) $\frac{2x^3 - 8x^2 - 5x - 2}{x + 1}$

c) $(3x^2 - 13x - 2) \div (x + 2)$

5. Determine each quotient using synthetic division.

a) $(4w^4 + 3w^3 - 7w^2 + 2w - 1) \div (w + 2)$

b) $\frac{x^4 + 2x^3 - 8x^2 - 5x - 2}{x - 2}$

c) $(5y^4 + 2y^2 - y + 4) \div (y + 1)$

6. Determine each remainder using synthetic division.

a) $(3x^2 - 16x + 5) \div (x - 5)$

b) $(2x^4 - 3x^3 - 5x^2 + 6x - 1) \div (x + 3)$

c) $(4x^3 + 5x^2 - 7) \div (x - 2)$

7. Use the remainder theorem to determine the remainder when each polynomial is divided by $x + 2$.

a) $-4x^4 - 3x^3 + 2x^2 - x + 5$

b) $7x^5 + 5x^4 + 23x^2 + 8$

c) $8x^3 - 1$

8. Determine the remainder resulting from each division.

a) $(3x^3 - 4x^2 + 6x - 9) \div (x + 1)$

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

c) $(6x^3 - 5x^2 - 7x + 9) \div (x + 5)$

9. For $(2x^3 + 5x^2 - kx + 9) \div (x + 3)$, determine the value of k if the remainder is 6.

10. When $4x^2 - 8x - 20$ is divided by $x + k$, the remainder is 12. Determine the value(s) of k.