Name: _____ Date: _____

Learning Goal 1.1	Given a polynomial expression, identify the GCF and use it to find factored form.

Assignment

1. Factor the following expressions.

a. $5y + 10$ b. $6 + 12x^2$ c. $9k + 6$ d. $4s^2 + 14s$

e. $y + y^2$ f. $3h + 7h^2$ g. $8y^3 - 12y$ h. $-7d - 14d^4$

i. $9b^2 - 12b^3$ j. $48s^3 - 12$ k. $-a^2 - a^3$ l. $3x^2 + 6x^4$

a. $3x^2 + 12x - 6$ b. $4 - 6y - 8y^2$ c. $-7m - 7m^2 - 14$ d. $10n - 6 - 12n^2$

e. $8 + 10x + 6x^2$ f. $-9 + 12b + 6b^2$ g. $5 + 15m^2 - 10m^3$ h. $27n + 36 - 18n^3$

i. $6v^4 + 7v - 8v^3$ j. $-3c^2 - 13c^4 - 12c^3$ k. $24x + 30x^2 - 12x^4$ l. $s^4 + s^2 - 4s$

m. $4s^2t^2 + 12s^2t^3 + 36st^2$ n. $12s^2t^3 - 4s^2t^2 - 36st^2$ o. $-3a^3b - 9a^4b + 8a^2b$

p. $9a^4b + 3a^3b - 8a^2b$ q. $36x^2y^4 + 12x^3y^2 + 12x^4y^3$ r. $-36x^2y^4 - 12x^4y^3 - 12x^3y^2$

s. $25xy + 15x^2 - 30x^2y^2$ t. $51m^2n + 39mn^2 - 72mn$ u. $9p^4q^2 - 6p^3q^3 + 12p^2q^4$

v. $10a^3b^2 + 12a^2b^4 - 5a^2b^2$ w. $12cd^2 - 8cd - 20c^2d$ x. $7r^3s^3 + 14r^2s^2 - 21rs^2$

2. Simplify each expression by combining like terms, then factor.

a. $x^2 + 6x - 7 - x^2 - 2x + 3$ b. $12m^2 - 24m - 3 + 4m^2 - 13$

c. $-7n^3 - 5n^2 + 2n - n^2 - n^3 - 12n$

3. A formula for the surface area, SA, of a cylinder with base radius r and height h is

$$SA = 2\pi r^2 + 2\pi rh$$

   a. Factor this formula.
   b. Use both forms of the formula to calculate the surface area of the cylinder with base radius of 12 cm and height 23 cm. Is one form of the formula more efficient to use than the other? Explain.

4. Suppose n is an integer. Is $n^2 - n$ always an integer? Justify your answer.

5. A cylindrical bar has base radius r and height h. Only the curved surface of a cylindrical bar is to be painted.
    a. Write an expression for the fraction of the total surface area that will be painted.
    b. Simplify the fraction.

6. A diagonal of a polygon is a line segment joining non-adjacent vertices.
    a. How many diagonals can be drawn from one vertex of a pentagon? A hexagon?
    b. Suppose the polygon has n sides. How many diagonals can be drawn from one vertex?
    c. The total number of diagonals of a polygon with n sides is

$$\frac{n^2}{2} - \frac{3n}{2}.$$

    Factor this formula. Explain why it is reasonable.