Polynomials can be multiplied using the distributive property.

Example 1: Simplify. a. $4b(5b^2 + b + 6)$ b. $-2g^2(3g^3 + 6g - 5)$

A **Greatest Common Factor** is the largest factor that divides evenly into each term. It is called the **GCF** for short. Using the reverse order for the distributive property is called **factoring**.

Example 2: Find the GCF of the terms in each polynomial. Then use the GCF to factor each polynomial.

  a. $2x^4 + 10x^2 - 6x$ **GCF** _____

  b. $4x^3 - 8x^2 + 12x$ **GCF** _____

  c. $-x^3 + 3x^2 - 7x$ **GCF** _____

  d. $-12x^6 - 18x^4 + 30x^2$ **GCF** _____

Investigation: Suppose that you want to design a rectangular pen for your dog, using 20 feet of fencing. You decide that the length of each side must be an integer number.

1. Complete the table showing all possible dog pen dimensions. At the bottom of the chart, generalize the information given one side to be of length x.

Length of Side 1 (ft.)	Length of Side 2 (ft.)	Perimeter (ft.)	Area (sq. ft.)
1			
2			
X			

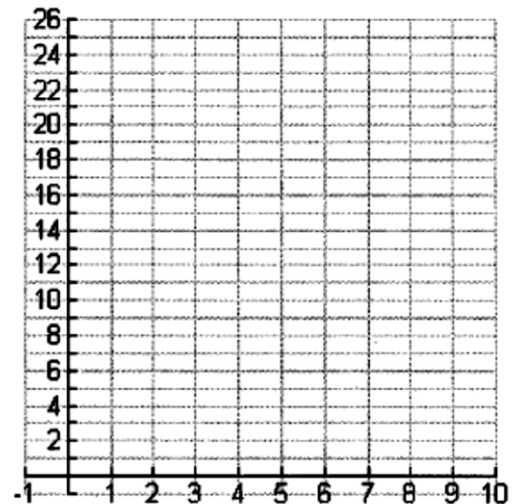3. Explain why the perimeter remains constant.

4. a. Which dimensions give the dog the most area?

   b. Which dimensions give the dog the longest run?

   c. Which dimensions would you recommend for the pen? Explain your answer.

5. Using a graphing calculator, graph your formula.

6. What is the shape of this equation?

Homework: Unit 5 Day 2 Worksheet

Simplify each expression.

1) $-6(a + 8)$

2) $4(1 + 9x)$

3) $6(-5n + 7)$

4) $(9m + 10) \cdot 2$

5) $(-4 - 3n) \cdot -8$

6) $8(-b - 4)$

7) $(1 - 7n) \cdot 5$

8) $-6(x + 4)$

9) $5(3m - 6)$

10) $(-6p + 7) \cdot -4$

Factor the common factor out of each expression.

1) $15 + 24k - 18k^2$

2) $30p^4 + 18p^2 + 12$

3) $9k^4 - k^2 + k$

4) $10x^4 - 9x^2 + 6$

5) $18n^3 + 18n^2 + 9n$

6) $30a^3 + 45a^4 - 50a^6$

7) $30n^3 + 100n + 20$

8) $-9p^3 + 8p - 3$

9) $8p^7 + 10p^5 - 4p^4$

10) $24n^4 + 6n^2 + 42n$

11) $-36a^5b^4 + 9a^3b + 90a^2b$

12) $16x^2y^3 + 16x^2y^2 + 12xy^2$