

Course: MFM2P Gr. 10 AppliedLesson: 6-7Unit: Quadratic ExpressionsTopic: Common Factoring

✚ *homework check:* Lesson 6 - 6

✚ *note:* Common Factoring

Factoring is the opposite operation of expanding just as addition is the opposite operation of subtracting and multiplication is the opposite operation of division. To common factor an expression, we must identify the greatest common factor (GCF) for all terms in the polynomial. The GCF is the biggest number, variable or combination of both that can be divided into all terms of the expression. For example, identify the GCF in each situation.

$$\begin{array}{ll} a) 3x^2, 12y & GCF = \\ & = 3 \end{array} \qquad \begin{array}{ll} b) 14x, -7x^2 & GCF = \\ & = 7x \end{array}$$

Part of common factoring is identifying the greatest common factor. If the GCF is not identified correctly, the polynomial may not be factored. Common factor each of the following.

$$\begin{aligned} a) 12x^2 + 6x &= \text{identify the GCF} \\ &= 6x \left(\frac{12x^2}{6x} + \frac{6x}{6x} \right) \text{ divide each term by the GCF} \\ &= 6x(2x + 1) \end{aligned}$$

$$\begin{aligned} b) 24x^2 - 16x &= \text{identify the GCF} \\ &= 8x \left(\frac{24x^2}{8x} - \frac{16x}{8x} \right) \text{ divide each term by the GCF} \\ &= 8x(3x - 2) \end{aligned}$$

c) A rectangle has an area of $(90x^2 - 54x)$. What is the length of each side? Find an expression that represents the perimeter of the rectangle.

Solution: If we want to find two expressions that multiply to give $(90x^2 - 54x)$, we can use our common factoring skills.

$$\begin{aligned}(90x^2 - 54x) &= \\ &= 18x \left(\frac{90x^2}{18x} - \frac{54x}{18x} \right) \\ &= 18x(5x - 3)\end{aligned}$$

Therefore, the length is $18x$ and the width is $5x - 3$.

Now that we know the dimensions of the rectangle, we can find an expression for the perimeter.

The formula for perimeter of a rectangle is

$$P = 2(l + w)$$

$$P = 2(18x + 5x - 3)$$

$$P = 2(23x - 3)$$

$$P = 26x - 6 \text{ units}$$

✚ **homework assignment: Lesson 6 - 7**

Lesson 6 – 7: Common Factoring**Mark (/40): _____****1. Find the Greatest Common Factor (GCF) of each set of terms. (2 marks)**

a) 8, 18

b) $4x^2, 8x^2, 12x$

2. Find the GCF and write the factored form. (4 marks)

a) $3x + 15 =$

b) $-7x + 21x^2 =$

3. Factor. (6 marks)

a) $3x^2 - 12x + 18 =$

b) $-10x^2 + 20x - 30 =$

4. Factor. (4 marks)

a) $6x^2 + 12x =$

b) $9x^2 + 18x =$

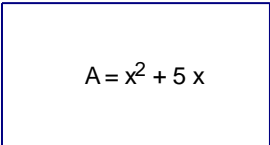
5. Factor. (4 marks)

a) $8x - 24 =$

b) $x^2 + 5x =$

6. A swimming pool has the area shown. (6 marks)

a) Factor the expression to determine the length and width of the pool.


$$A = x^2 + 5x$$

b) Find the actual measures of the length and width is $x = 2m$

c) Find the perimeter of the pool.

7. Find the dimensions of each rectangle given the area. (4 marks)

a) $A = 21x^2 + 3x$

b) $A = 2x^2 + 18x$

8. Two neighbouring lawns, the area of which are represented by the expressions $A = 2x^2 + 7x$ and $B = 2x^2 + 9x$, are combined to form one large mowing contract. The shape of the combined lawns is rectangular. (6 marks)

a) Write and simplify the expression representing the combined lawns?

b) Factor the expression of the combined lawns.

c) What are the actual dimensions of the combined lawns if $x = 13m$?

9. Factor completely. (4 marks)

a) $8xy - 4y =$

b) $5x^2y - 10xy + 15xy^2 =$