

Course: MFM2P Gr. 10 AppliedLesson: 6-9Unit: Quadratic ExpressionsTopic: Factoring Trinomials✚ *homework check:* Lesson 6 - 8✚ *note:* Factoring Trinomials

Most trinomials have the form $y = ax^2 + bx + c$. One or more variables can have values that make it possible for the form to change. For example, a difference of squares is missing the ' bx ' term because the value of ' b ' is zero. In the trinomial $x^2 + 5x + 6$, the value of ' a ' is one which is not necessary to write and in the binomial $3x^2 - 6x$ the value of ' c ' is zero. When we are factoring it is very helpful to recognize these differences.

Because factoring is the opposite operation of expanding, we need to recognize patterns that occur in order to factor. For example, the last step when expanding binomials into trinomials is the collection of like terms. So when we are factoring, we must look for numbers that sum (or collect) to give the value of ' b '. The value of ' c ' happens when we multiply to last terms in our binomials. So when we factor, we want to find *one pair of numbers* that collect to give ' b ' and multiply to give ' c '.

Find the number that satisfies the given conditions.

Product c	Sum b	numbers
9	6	3, 3
5	6	5, 1
-24	5	8, -3
-30	-13	-15, 2
18	-9	-6, -3

For example, factor each of the following trinomials.

a) $x^2 + 8x + 16 =$ identify c and b

$c = 16$

$b = 8$

What pair of numbers has a product of 16 and a sum of 8?

$$x^2 + 8x + 16 =$$

$$= (x + 4)(x + 4)$$

$$b) x^2 - 2x - 24 =$$

$$c = -24$$

$$b = -2$$

What pair of numbers has a product of -24 and a sum of -2?

$$x^2 - 2x - 24 =$$

$$= (x - 6)(x + 4)$$

$$c) x^2 - 11x + 10 =$$

$$c = 10$$

$$b = -11$$

What pair of numbers has a product of 10 and a sum of -11?

$$x^2 - 11x + 10 =$$

$$= (x - 10)(x - 1)$$

$$d) x^2 + 7x - 18 =$$

$$c = -18$$

$$b = 7$$

What pair of numbers has a product of -18 and a sum of 7?

$$x^2 + 7x - 18 =$$

$$= (x + 9)(x - 2)$$

✚ homework assignment: Lesson 6 - 9

Lesson 6 – 9: Factoring Trinomials**Mark (/64): _____****1. Complete the chart. (8 marks)**

Product	Sum	Two integers
20	9	
18	11	
12	-7	
-14	-5	

2. Factor each trinomial. (8 marks)

a) $x^2 + 12x + 36 =$

b) $x^2 - 12x + 27 =$

c) $x^2 + 7x - 30 =$

d) $x^2 - 16x - 36 =$

3. Find the binomials that represent length and width given each area. (8 marks)

a) $A = x^2 + 24x + 44$

b) $A = x^2 - 4x - 5$

c) $A = x^2 + 9x - 22$

d) $A = x^2 - 9x + 20$

4. Factor. (8 marks)

a) $x^2 + 12x + 20 =$

b) $x^2 + 5x + 6 =$

c) $x^2 + 9x + 14 =$

d) $x^2 + 6x + 9 =$

5. Factor to find the binomials that represent the length and width. (8 marks)

a) $A = x^2 + 8x + 15$

b) $A = x^2 - 3x - 10$

c) $A = x^2 - 5x + 6$

d) $A = x^2 - 2x - 8$

6. The area of an Olympic pool is modelled by the equation $A = x^2 + 9x + 8$. (4 marks)

a) Find expressions for the dimensions of the pool.

b) Suppose the length of the pool is 33m, find the area of the pool.

7. The area of Fred's garden is represented by the trinomial $A = x^2 + 12x + 36$. (4 marks)

a) Factor to find the length and width of the garden.

b) Calculate the actual dimensions if $x = 3m$.

12. Factor completely. (12 marks)

a) $3x^2 + 21x + 30 =$

b) $4x^2 - 12x - 72 =$

c) $-x^2 + 4x - 3 =$

d) $2x^2 + 4x + 2 =$

13. The perimeter of a rectangle is 32 cm. Its area is $A = x^2 + 5x - 14$. Find the actual dimensions of the rectangle. (4 marks)