Lesson 5

AN5 Demonstrate an understanding of common factors and trinomial factoring, concretely, pictorially and symbolically.

**Factoring Trinomials of the form x2 + bx + c**

You may have noticed in Lesson 1 that when two binomials of the form ( x + number 1)(x + number 2) are multiplied the resulting trinomial was always

 X2 + (number 1 + number2) x + ( number 1 x number2)

For example

(x + 6)(x +9) = x2 + 15x + 54

 (6 + 9) ( 6 x 9)

 Or

(x-7)(x+5) = x2 -2x -35

 (-7+5) (-7x5)

We can use this pattern to factor trinomials of the form x2 + bx + c

\*\*\*Note: This method works only when the coefficient of x2 is 1\*\*\*

**To determine the factors of a trinomial of the form x2 + bx +c, first determine 2 numbers whose product is c and whose sum is b. These numbers are the constant terms in the two binomial factors, each of which has x as it’s first term.**

Ex 1:

Factor: x2 +7x + 12

Look for two numbers that multiply to 12

Possibilities: 1,12

 2,6

 3,4

The 2 numbers that sum to 7 are 3 and 4 so

 x2 +7x + 12= ( x +3) ( x+4)

Ex 2:

Factor: x2 – 5x -50

Look for 2 numbers that multiply to give -50

Possibilities

 -1, 50 1,-50

 -2, 25 2, -25

 -5, 10 5, -10

The pair of numbers that add to -5 are -10 and 5 so

 x2 – 5x -50 = (x -10)(x +5)

Ex 3:

Factor: x2 - 7x + 10

Look for two numbers that multiply to give 10 and add to give -7. ( Both factors must be negative)

 Possibilities:

-1, -10 or -2,-5

The pair that adds to -7 are -2 and -5 so

 x2 - 7x + 10 = ( x -2)(x -5)

**Combining Common Factoring with Simple Trinomial Factoring**

What happens if the coefficient of the x2  is not 1?

**LOOK FOR A COMMON FACTOR**

Ex 4:

 2x2 -12x + 10

The coefficient of x2 is not 1, but 2 divides in to all three terms in the polynomial so it is the common factor.

Common factoring

 2x2 – 12x + 10 = 2( x2 -6x +5)

Then look for 2 numbers that multiply to give 5 and add to give -6. The two numbers would be -1 and -5 so finish the factoring

 2x2 -12x + 10 = 2(x2 -6x +5)

 = 2( x-1)(x-5)

Ex 5:

 Factor: -5h2 -20h +60

Common factor is -5 so

-5h2 -20h +60= -5( h2 +4h – 12)

Look for 2 numbers that multiply to give -12 and add to give 4

Possibilities:

 -1,12 1,-12 -2,6 2,-6 -3,4 3,-4

-2 and 6 add to give 4 so

-5h2 -20h +60= -5( h2 +4h – 12)

 = -5(h+6)(h-2)

Extra practice questions from textbook: p.166-167 #11,14 & 15, 20