MBF 3C1 Name: _____

Factoring by Sum & Product

Factor by Sum & Product when given a trinomial in the form ax^2+bx+c, where $a=1$.

To Factor Using Sum & Product:

1. Find two factors of c which also add to be b. (start with combinations for the product, c If product is positive use two positives or two negatives If product is negative use one of each)	$x^2+4x-12$ Sum Product 1 −1 (2) −2 −3 3 −12 12 (−6) 6 4 −4
2. Create two sets of brackets. 3. Square root the first term of the polynomial and place one in each bracket in the first position. 4. Put one of the factors found in step 1 in each of the brackets.	$(x+2)(x-6)$

Helpful Hints:

- if b is + and c is + then both factors are +
- if b is − and c is + then both factors are −
- if b is + and c is − then the larger factor is + and the smaller factor is −
- if b is − and c is − then the larger factor is − and the smaller factor is +

Example 1

a. $x^2+8x+12$ 1 (2) 3 / 12 (6) 4

$=(x+2)(x+6)$

b. $x^2-7x-18$ −1 1 (2) −2 / 18 −18 (−9) 9

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

c. x^2-5x+6 1 2 −1 (−2) / 6 3 −6 (−3)

$(x-2)(x-3)$

d. $x^2+12x+11$ (1) / (11)

$(x+1)(x+11)$

e. $x^2-2x-15$ −1 1 −3 (3) / 15 −15 5 (−5)

$(x+3)(x-5)$

f. $x^2-13x+22$ 1 2 −1 (−2) / 22 11 −22 (−11)

$(x-2)(x-11)$