

4.4 FACTORING QUADRATIC EXPRESSIONS

TO FACTOR : TO WRITE AS A PRODUCT

Ex: $2x^2 + 4x + 10$

$$2x^2 + 4x + 10 = 2(x^2 + 2x + 5)$$

PRODUCT

Ex: $12x^2 - 4x$

$$12x^2 - 4x = 4x(3x - 1)$$

TO FACTOR $x^2 + bx + c$

FIND TWO NUMBERS THAT MULTIPLY TO GET C AND ADD TO GET B.

Ex: FACTOR $x^2 + 7x + 12$

FACTORS OF 12

1 · 12

2 · 6

3 · 4

-1 · -12

-2 · -6

-3 · -4

SUM

13

8

7

$(x+3)(x+4)$

Ex: FACTOR $x^2 + x - 20$

$$(x+5)(x-4)$$

Ex: FACTOR $x^2 - 14x - 72$

$$(x-18)(x+4)$$

To FACTOR $\underline{ax^2 + bx + c}$ $a \neq 1$

Ex: FACTOR $6x^2 + x - 12$

$$\underline{-72}$$

$$\underline{\quad}$$

1

$$\underline{-72}$$

9

-8

1

$$\underline{-72}$$

9

3

-8

2

1

$$\underline{-72}$$

9

3

3

-8

2

-4

1

$$(3x-4)(2x+3)$$

Ex: $6x^2 + 11x - 35$

$$\begin{array}{r} -210 \\ \hline 21 \quad 3 \quad 7 \\ -10 \quad 2 \quad -5 \\ \hline 11 \end{array}$$

$$(3x-5)(2x+7)$$

SPECIAL FACTORS

① $x^2 - y^2 = (x-y)(x+y)$

② $x^2 + 2xy + y^2 = (x+y)^2$

③ $x^2 - 2xy + y^2 = (x-y)^2$

Ex: FACTOR

a) $x^2 - 9$

b) $4x^2 - 25$

c) $x^2 - 6x + 9$

d) $2x^2 + 16x + 32$

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

$$(2x-5)(2x+5)$$

$$(x-3)^2$$

$$2(x^2 + 8x + 16)$$

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