L5 Factoring Trinomials a=1

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Lesson 5 Factoring Trinomials_____

Factoring Trinomials

Trinomial: a polynomial containing three terms

Form: $\underline{a}x^2 + \underline{b}x + \underline{c}$, where $a = 1$

In order to factor we can determine our factors using PSF

- Product $(a \cdot c)$ $1 \cdot 6$
- Sum (b) 5
- Factors of the product (a)(c)
  (that have a sum of b)

ie. $1 x^2 + 5x + 6$

$(x+2)(x+3)$

P 6
S 5
F $3, 2$

Use multiplication to check

$(x+2)(x+3)$

$x^2 + 3x + 2x + 6$

$x^2 + 5x + 6$

Example 1
Factor.

a) $1 x^2 - 2x - 8$

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

$a=1 \quad b=-2 \quad c=-8$

P -8
S -2
F $2, -4$

$(x-4)(x+2)$ ← binomial factors

$2, -4 \quad 2+(-4) = -2$

$-2, 4 \quad -2+4 = 2$

b) $x^2 - 12x + 35$

$(x-7)(x-5)$

P 35
S -12
F $-5, -7$

$5, 7 \quad \cdot 12$
$5+7 \cdot 12$

$-5, -7$
$-5 +(-7) = -12$

c) $x^2 + x - 12$

P -12 $(x-3)(x+4)$ $4, -3$
S 1 $4 + (-3) = 1$
F $4, -3$

d) $n^2 + 10n + 25$ ← Perfect square trinomial

P 25 $(n+5)(n+5)$
S 10 or
F $5, 5$ $(n+5)^2$

Try $x^2 + 25x + 24$ $(x+24)(x+1)$
    $x^2 - 10x + 25$ $(x-5)(x-5)$
                            or
                         $(x-5)^2$

e) $x^4 + 11x^2 + 24$

P 24 $(x^2+8)(x^2+3)$
S 11
F $3, 8$

Example 3
Factoring a Trinomial Written in Ascending Order
Factor.
$-24 - 5d + d^2$

rewrite
$d^2 - 5d - 24$

$(d+3)(d-8)$

P -24
S -5
F $-8, 3$

Try $x^2 + x - 72$

P -72 $(x+9)(x-8)$
S 1
F $-8, 9$

$4 - 5x + x^2$
$x^2 - 5x + 4$

P 4 $(x-1)(x-4)$
S -5
F $-4, -1$

Example 4
Factoring a Trinomial with a Common Factor
Factor.
a.) $2x^2 - 4x - 30$

b.) $-5h^2 - 20h + 60$