

Factoring Practice

Ex/ Common factor each of the following:

a) $\frac{3x^2}{3} + \frac{6x}{3} + \frac{9}{3}$

= $3(x^2 + 2x + 3)$

b) $\frac{5x^2}{5x^2} - \frac{10x^4}{5x^2} + \frac{15x^3}{5x^2}$

= $5x^2(1 - 2x^2 + 3x)$

c) $8x^2y^3 - 4x^4y + 2xy^2$

= $2xy(4xy^2 - 2x^3 + y)$

Ex/ Factor each of the following simple trinomials:

a) $x^2 + 4x - 12$

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

$m = -12$
 $A = 4$
 $N = 6, -2$

b) $x^2 - 11x + 30$

= $(x-5)(x-6)$

c) $x^2 + 8xy - 20y^2$

= $(x + 10y)(x - 2y)$

Common factor ↪

d) $-2x^2 - 30x - 72$

= $-2(x^2 + 15x + 36)$

= $2(x+12)(x+3)$

$m = 36$
 $A = 15$
 $N = 12, 3$

Ex/ Factor the following complex trinomials:

a) $2x^2 - 7x - 4$

= $2x^2 - 8x + 1x - 4$

= $2x(x-4) + 1(x-4)$

= $(x-4)(2x+1)$

$m = -8$
 $A = -7$
 $N = -8, 1$

b) $3x^2 - 5x - 12$

= $3x^2 - 9x + 4x - 12$

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

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

$m = -36$
 $A = -5$
 $N = -9, 4$

c) $8x^2 - 14x + 3$

= $8x^2 - 12x - 2x + 3$

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

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

$m = 24$
 $A = -14$
 $N = -12, -2$

Ex/ Factor the following difference of squares.

a) $a^2 - 16$

= $(a-4)(a+4)$

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different signs

b) $x^2 - 64$

= $(x-8)(x+8)$

Common factor ↪

c) $5a^2 - 20$

= $5(a^2 - 4)$

= $5(a-2)(a+2)$

Ex/ Factor completely.

a) $x^2 - 13x + 22$

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

$m = 22$
 $A = -13$
 $N = -11, -2$

b) $3x^2 - 9x$

= $3x(x-3)$

c) $25x^2 - 49y^2$

= $(5x-7y)(5x+7y)$

d) $2x(x+5) - 1(x+5)$

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

e) $12x^2 - 5x - 3$

= $12x^2 - 9x + 4x - 3$

= $3x(4x-3) + 1(4x-3)$

= $(4x-3)(3x+1)$

$m = -36$
 $A = -5$
 $N = -9, 4$

f) $x^2 - 18x + 81$

= $(x-9)(x-9)$

= $(x-9)^2$

$m = 81$
 $A = -18$

Ex/ For $y = -3x^2 + 9x + 30$ identify:

- a) The direction of opening.
- b) The y-intercept.
- c) The vertex.
- d) The zeros.

a) down (a-value)

b) $x=0, y=30$

c) $x = -\frac{b}{2a}$

$= -\frac{9}{2(-3)}$

$= -\frac{9}{-6}$

$= 1.5$

plug it back in

$y = -3(1.5)^2 + 9(1.5) + 30$
 $= 36.75$

$V(1.5, 36.75)$

d) Factor: $y = -3(x^2 - 3x - 10)$
 $= -3(x-5)(x+2)$
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 (5,0) (-2,0)

$M = -10$
 $A = -3$
 $N = -5, 2$