Factoring Strategies

Apr. 6/2016

Consider the factoring methods we have explored so far:

1. Common Factors $3x^2 + 6x + 9$
2. Factoring by Grouping $ac + ad + bc + bd$
3. Simple Trinomials $x^2 + bx + c$
4. Complex Trinomials $ax^2 + bx + c$, a not 1
5. Perfect Squares $a^2 + 2ab + b^2$
6. Difference of Squares $a^2 - b^2$

It is often sufficient to use only one method, but there are times when they must be combined. This occurs most often when **common factors** are involved.

Mar 29-11:14 AM

Always check for common factors before you start **and** after you think you are done.

When you are asked to "fully factor" or "factor completely", all common factors must also be accounted for.

Ex.1 Remove Common Factors First and Last

$$4x^2 - 20x + 24$$

$= 4(x^2 - 5x + 6)$

S: -5 P: 6 I: -2, -3

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

$= 4x^2 - 8x - 12x + 24$

$= 4x(x-2) - 12(x-2)$

$= (x-2)(4x-12)$

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

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

S: -20
P: 96
I:

1 × 96
2 × 48
3 × 32
4 × 24
6 × 16
$\boxed{-8 \times -12}$
~~12 × 8~~

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Ex.2 Determine the strategies required to factor:

(a) $x^2 + 8x + 15$

simple

(b) $6x^2 + 19x + 8$

complex

(c) $40x^2 - 250$

① common factor
② diff. of squares

(d) $4x^2 - 8x + 4$

① CF = 4
② Simple or perfect square

(e) $9x^2 + 48x + 64$

$(3x)^2 \quad (8)^2$

perfect square

(f) $-5x^2 + 60x - 180$

$= -5(x^2 - 12x + 36)$

① CF = -5
② simple or perfect

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Assigned Work:

p. 236 # 1, (6-8)ace, 9, 10, 12, 14ac, 17*

be c d

Review:

p.184 # 1, 3, 5, 8, 9, 10, 11ace, 12, 14ace, 15ac, 16

p.240 # 2, 6, 7, 9, 10, 13ace, 16ace, 17ace, 19ace

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6(e) $12x^2+4x-21$

$= 12x^2-14x+18x-21$

$= 2x(6x-7)+3(6x-7)$

$= (6x-7)(2x+3)$

S 4
P -252
I

-14, 18

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4(c) $15x^2+6xy-5x-2y$

$= 3x\underbrace{(5x+2y)}-1\underbrace{(5x+2y)}$

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

There is still a common factor of $(5x+2y)$.

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10 (d) $x^2 - y^2 - 2y - 1$

$= x^2 - (y^2 + 2y + 1)$

$= x^2 - (y+1)^2$

$= x^2 - a^2$

$= (x+a)(x-a)$

$= (x+y+1)(x-(y+1))$

$= (x+y+1)(x-y-1)$

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14 (c) $x^2y + 6y - 9xy + x^2y + xy$

$\boxed{= (x+y)(\qquad\qquad) ?}$

$= 2x^2y + 6y - 8xy$

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

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

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

S -4
P 3
I $-1, -3$

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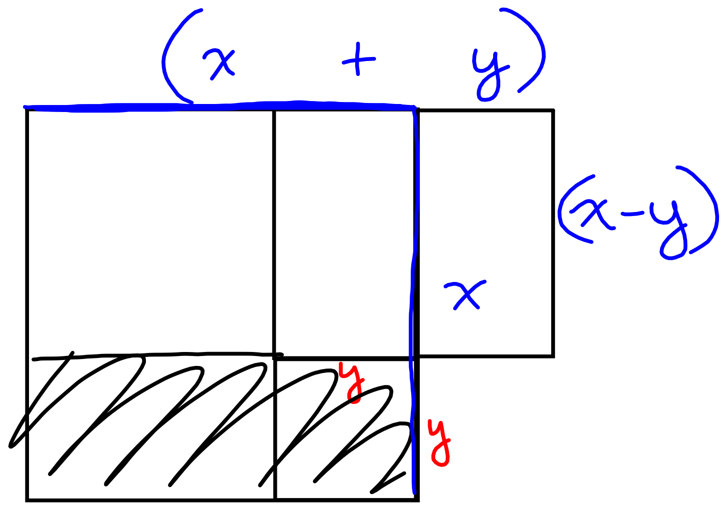
17.



$$A_{remaining} = x^2 - y^2$$
$$= (x+y)(x-y)$$

$$A_{outer} = x^2$$

$$A_{small} = y^2$$

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