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Homework SOLUTIONS

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Questions: 10, 13, 15ab, 21ce

10. Copy and complete.

a) $(w + 3)(w + 2) = w^2 + \square w + 6$ Multiply Add

b) $(x + 5)(x + \square) = x^2 + \bigcirc x + 10$ Multiply Add

c) $(y + \bigcirc)(y + \square) = y^2 + 12y + 20$ Multiply Add

13. Find and correct the errors in each expansion.

a) $(r-13)(r+4) = r(r+4) - 13(r+4)$
$= r^2 + 4r - 13r + 52$
$= r^2 + 9r + 52$

b) $(s-15)(s-5) = s(s-15) + 15(s+5)$
$= s^2 - 15s + 15s + 75$
$= s^2 + 75$

15. Factor. Check by expanding.

a) $12 + 13k + k^2$

$k^2 + 13k + 12$

b) $-16 - 6g + g^2$

$g^2 - 6g - 16$

c) $60 + 17y + y^2$

$y^2 + 17y + 60$

d) $72 - z - z^2$

$z^2 - z - 72$

19. Find an integer to replace □ so that each trinomial can be factored. How many integers can you find each time?

a) $x^2 + \square x + 10$

b) $a^2 + \square a - 9$

c) $t^2 + \square t + 8$

d) $y^2 + \square y - 12$

e) $h^2 + \square h + 18$

f) $p^2 + \square p - 16$

20. Find an integer to replace □ so that each trinomial can be factored. How many integers can you find each time?

a) $r^2 + r + \square$

b) $h^2 - h + \square$

c) $b^2 + 2b + \square$

d) $z^2 - 2z + \square$

e) $q^2 + 3q + \square$

f) $g^2 - 3g + \square$

21. Factor.

c) $4x^2 + 4x - 48$

e) $-5n^2 + 40n - 35$

a) $4y^2 - 20y - 56$

b) $-3m^2 - 18m - 24$

d) $10x^2 + 80x + 120$

f) $7c^2 - 35c + 42$

Factoring Trinomials

#1

$x^2 - 17x + 42$ (same)

largest factor is -

$(x-3)(x-14)$

mult last / add middle

+42 | -17

-1 x -42

-2 x -21

-3 x -14

-6 x -7

#2

last mult / mid add

-38 / -17

+1 x -38

+2 x -19

$x^2 - 17x - 38$ (diff)

sign on largest

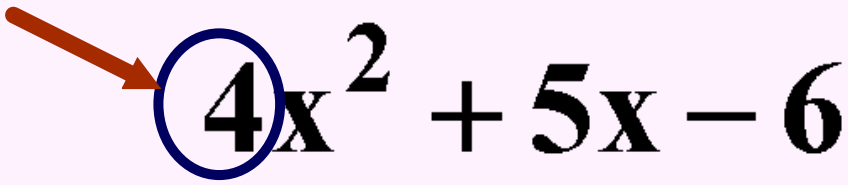
$(x+2)(x-19)$

#3

$4x^2 + 5x - 6$

DECOMPOSITION

If there is a *numerical coefficient* in front of x^2, then we use a method for factoring called *DECOMPOSITION.*



Hard Trinomials

- has three terms with the form...

$$ax^2 + bx + c$$

- a hard trinomial has an "a" value **not equal to 1**.

- we use a method of decomposition to factor them.

DECOMPOSITION METHOD

- here's how it goes... "What two numbers?"

middle

Adds to get "b"

$$ax^2 + bx + c$$

Multiplies to get "a" times "c"

first times last

- once you find the two numbers, use them to break the MIDDLE TERM into two pieces (decomposition).

- then, factor by grouping.

add → middle
+5

Multiply

$4x^2+5x-6$

Sign on largest

different

$\_ + \_ = +5$

$\_ \times \_ =$ ■

Mult (1st × Last) 4x-6

-24

$-1 \times +24$

$-2 \times +12$

$-3 \times +8$

$-4 \times +6$

break middle term

$4x^2 + 8x - 3x - 6$

factor by part

factor by part
GCF out

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

are the same

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

$4xy - 3y$

$y(4x - 3)$

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

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

Always check the following when you are asked to factor:

1) G.C.F (# and Letters) {if not....}
2) Simple Trinomial
3) Hard Trinomial ...

Factor Completely!

1. $2x^2+5x+3$

1st x last | mid
mult | add
+6 | +5
+1 x +6
+2 x +3

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

$2x(x+1) + 3(x+1)$

$(x+1)(2x+3)$ same

$(2x+3)(x+1)$

Factor Completely!

2. $10x^2+13x-3$

mult | midd

-30 | $+13$

-1×30

-2×15

-3×10

-6×5

$10x^2-2x+15x-3$

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

same

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

$10x^2+15x-2x-3$

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

same

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

★ 4. $2x^2+6x+4$ ★

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

Simple

mult	add
$+1 \times +2$	$+3$

$2(x+1)(x+2)$