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Homework SOLUTIONS

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Questions: 10, 13, 15ab, 21ce

maybe 19 and 20

10. Copy and complete.

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

5

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

2

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

$2 \quad 10$

$1 \quad 20$
$2 \quad 10$
$4 \quad 5$

13. Find and correct the errors in each expansion.

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

$$r^2 + 4r - 13r - 52$$

$$r^2 - 9r - 52$$

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

$$s^2 - 5s - 15s - 75$$

$$-20s$$

15. Factor. Check by expanding.

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

$k^2 + 13k + 12$

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

$g^2 - 6g - 16$

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

$y^2 + 17y + 60$

$(y+12)(y+5)$

d) $72 - z - z^2$

$z^2 - z - 72$

$(z-9)(z+8)$

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

Large ←   *Signs a* ←

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

$+1, +10$
$+2, +5$

9
or
7

larger ←   *Sign diff* ←

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

$+8$
or
O

$-1, 9$
$-3, 3$

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) $r^2 + 1r + \boxed{\frac{1}{4}}$ _a large ✓ signs same_

$\bigoplus$
$+1$

$\frac{1}{2} \overset{+1}{\underset{2}{}}$

b) $h^2 - 1h \neq \boxed{}$ -30

-1

$+5 \quad -6$ $\frac{-1}{2} \quad \frac{-1}{2}$

c) $b^2 + 2b + \boxed{}$

d) $z^2 - 2z + \boxed{}$

e) $q^2 + 3q + \boxed{}$

f) $g^2 - 3g + \boxed{}$

21. Factor.

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

$$4(x^2 + 1x - 12)$$

simple tri: $\dfrac{x}{-12} \quad \dfrac{+}{+1}$

$-1, 12$
$-2, 6$
$\boxed{-3, 4}$

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

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

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

$$-5(n^2 + 8n - 7)$$

$\dfrac{x}{-7} \quad \dfrac{+}{+8}$

$-1, 7$

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

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

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

Factoring Trinomials

#1 $x^2 - 17x + 42$

$$\dfrac{X}{+42} \qquad \dfrac{+}{-17}$$

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

$-1, 42$
$-2, -21$
$\boxed{-3, 14}$
$-6, 7$

#2 $x^2 - 17x - 38$

#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.*

$$4x^2 + 5x - 6$$

sign on larger factor $\oplus$

signs different

first + last
$$\frac{X}{-24}$$

middle
$$\frac{+}{+5}$$

$-1, +24$
$-2, +12$
$\boxed{-3, +8}$
$-4, +6$

use these factors to break middle

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

pull out GCF of 1st 2 terms

factor out GCF of Last two terms

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

factor out common bracket

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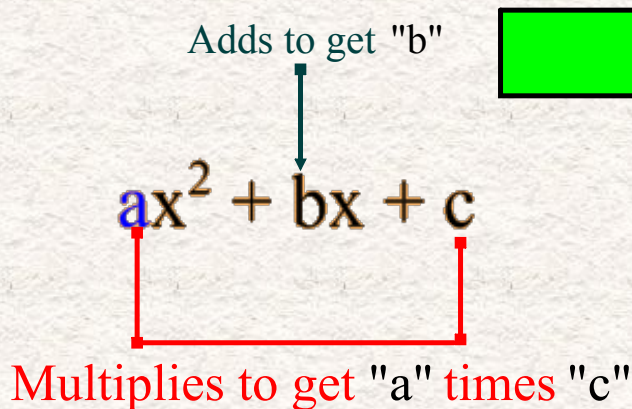
Hard Trinomials

- has <u>three</u> terms with the form...

$$ax^2 + bx + c$$

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

- we use a method of <u>decomposition</u> to factor them.

<u>DECOMPOSITION METHOD</u>

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

Adds to get "b"

$$ax^2 + bx + c$$

Multiplies to get "a" times "c"

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

- then, factor by grouping.

cdli Interactive

Global Actions

Go to beginning
Go back one frame
Go forward one frame
Go to end

Window Actions

Go to the first step ⏮
Go back one step ◀
Go forward one step ▶
Go to the last step ⏭
Show an object Show

Multiply

$$2x^2 - 11x + 12$$

largest
factor
sign

signs
same

$\underline{} + \underline{} = \boxed{-11}$

$\underline{} \times \underline{} = \boxed{24}$

$-1, -24$
$-2, -12$
$-3, -8$
$-4, -6$

$$2x^2 - 8x \quad -3x + 12$$

factor out
GCF

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

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

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!

largest
factor is (+)

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

Signs
diff

$\times$
-30

$+$
$+13$

$-1, 30$
$-2, 15$
$-3, 10$
$-5, 6$

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

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

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

We love Math!

$\_\_\dfrac{+}{}\_\_ =$

$\_\_\dfrac{x}{}\_\_ =$

⭐ 4. $2x^2 + 6x + 4$ ⭐

$2\left(x^2 + 3x + 2\right)$

↓

Simple trinomial

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

$\dfrac{x}{+2}\quad \dfrac{+}{+3}$

$\boxed{1,2}$

I suppose she wants me to do two types of factoring!
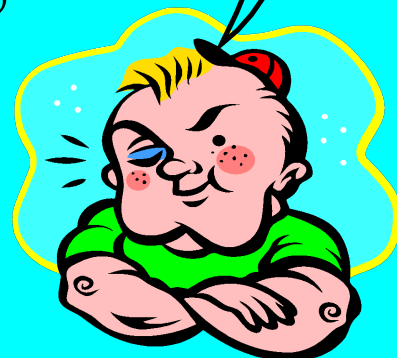
3.6   Polynomials of the Form $ax^2 + bx + c$

Homework

Test Tuesday, April 11

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Questions: 8, 13, 15, 19

$$\#13 \left(a\ b\ c\ d\ e\right)$$

.

Extra practice <small>if needed</small>

Math 10B   Name_____

Factoring: Hard Trinomials   Date_____

Factor each completely.

1) $6m^2 + 2m - 8$

2) $3x^2 - 16x + 5$

3) $28r^2 - 116r + 16$

4) $2n^2 - 17n - 9$

5) $3r^2 + 2r - 16$

6) $5a^2 - 34a + 45$

7) $8x^2 - 50x + 50$

8) $4n^2 - 15n + 9$

9) $4x^2 + 17x + 4$

10) $4m^2 + 13m + 10$

11) $4b^2 - 3b - 10$

12) $8n^2 - 26n - 24$

13) $u^2 + 16uv + 64v^2$

14) $2x^2 - 22xy + 48y^2$

15) $x^2 - 11xy + 30y^2$

16) $4a^2 - 8ab - 12b^2$