Warm-up 2-28

Write the prime factorization of the following number.

1. 200

Factor the following expressions.

2. $14x^2 - 7x$

3. $9a^2 + 18b + 7a^3 + 14ab$

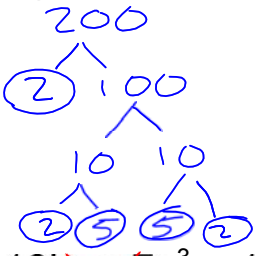
4. $x^2 - 5x - 24$

Warm-up 2-28

Write the prime factorization of the following number.

1. 200 = 2·2·2·5·5

$2^3 5^2$



Factor the following expressions.

2. $14x^2 - 7x$

$2 \cdot 7 \cdot x \cdot x$

$-7 \cdot x$

$7x(2x-1)$

3. $(9a^2 + 18b) + (7a^3 + 14ab)$

$3 \cdot 3 \cdot a \cdot a$

$2 \cdot 3 \cdot 3 \cdot b$

$2 \cdot 7 \cdot a \cdot a \cdot a$

$2 \cdot 7 \cdot a \cdot b$

$9(a^2 + 2b) + 7a(a^2 + 2b)$

$(a^2+2b)(9+7a)$

4. $x^2 - 5x - 24$

$-24x^2$

$3x \quad -8x$

$-5x$

	x	-8
x	x^2	$-8x$
3	$3x$	-24

$(x-8)(x+3)$

-24

$1 \cdot 24$

$2 \cdot 12$

$3 \cdot 8$

$6 \cdot 4$

$3(-8)$

$x^2 + 3x - 8x - 24$

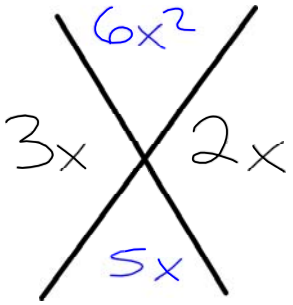
$x^2 - 5x - 24$ ✓

$(-2)(-2)(2)(2) \cdot x \cdot 3$

Practice

$x^2 + 5x + 6$

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



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

6

$3 \cdot 2$

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

$x^2 + 5x + 6$

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

Practice

Factor each trinomial. Check your answer.

$x^2 + 6x + 9$

9
3 3

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

$9x^2$, $3x$, $3x$, $6x$

	x	3
x	x^2	$3x$
3	$3x$	9

$x^2+3x+3x+9$
x^2+6x+9 ✓

$m^2 + m - 20$

$m^2+5m-4m-20$ ✓
$m^2+1m-20$

-20
5 · 4
2 · 10
20 · 1

$(m-4)(m+5)$

$-20m^2$, $5m$, $-4m$, $1m$

	m	-4
m	m^2	$-4m$
5	$5m$	-20

$a^2 - 8a + 15$

15
5 3

$(a-3)(a-5)$

$15a^2$, $-5a$, $-3a$, $-8a$

	a	-3
a	a^2	$-3a$
-5	$-5a$	$+15$

$a^2-5a-3a+15$
$a^2-8a+15$ ✓

$y^2 - 3y - 18$

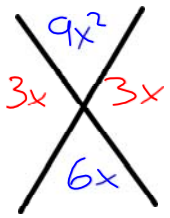
$(y-6)(y+3)$

Practice

Factor each trinomial. Check your answer.

$x^2 + 6x + 9$

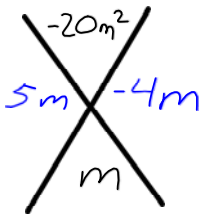
$(x+3)(x+3)$



	x	3
x	x^2	3x
3	3x	9

$m^2 + m - 20$

$(m+5)(m-4)$



	m	-4
m	m^2	-4m
5	5m	-20

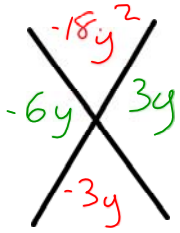
$a^2 - 8a + 15$

$(a-3)(a-5)$

	a	-3
a	a^2	-3a
-5	-5a	15

$y^2 - 3y - 18$

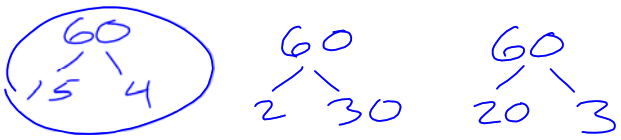
$(y-6)(y+3)$



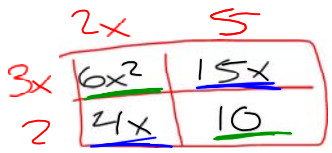
	y	3
y	y^2	3y
-6	-6y	-18

Section 9.4: Factoring Trinomials with a leading coefficient

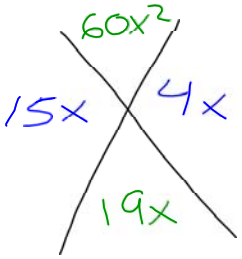
Remember:

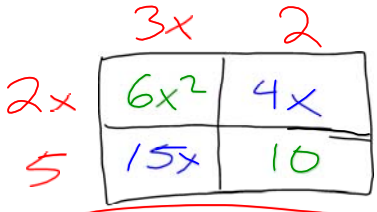


$(3x + 2)(2x + 5) = 6x^2 + 19x + 10$



$6x^2+19x+10$





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

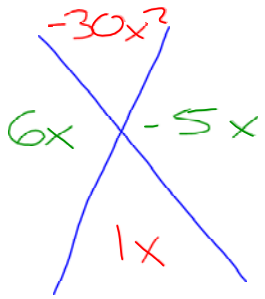
"X-Box" Method

$3x^2 + x - 10$

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

$3x^2+6x-5x-10$

$3x^2+1x-10$ ✓



	3x	-5
x	$3x^2$	-5x
2	6x	-10

"X-Box" Method

$5x^2 + 19x + 12$

$(5x+4)(x+3)$

	5x	4
x	$5x^2$	4x
3	15x	12

$5x^2+19x+12$ ✓

$60x^2$

$15x$ $\quad$ $4x$

$19x$

60
15 4

60
2 30

	5x	4
x	$5x^2$	4x
3	15x	12

3 · 5 x
2 · 2 · 3

Examples

$3n^2 - 8n + 4$

$2m^2 + 5m + 2$

$7a^2 + 53a + 28$

$9k^2 + 66k + 21$

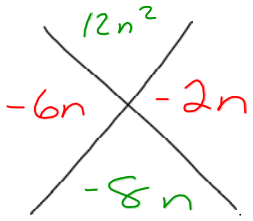
Examples

$3n^2 - 8n + 4$

$(3n-2)(n-2)$

$3n^2 - 6n - 2n + 4$

$3n^2 - 8n + 4$ ✓



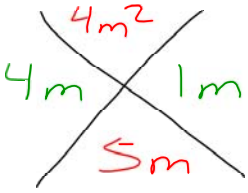
	3n	-2
n	$3n^2$	$-2n$
-2	$-6n$	$+4$

$2m^2 + 5m + 2$

$(2m+1)(m+2)$

$2m^2 + 4m + 1m + 2$

$2m^2 + 5m + 2$ ✓



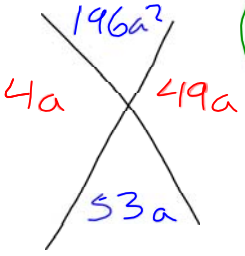
	2m	1
m	$2m^2$	$1m$
2	$4m$	2

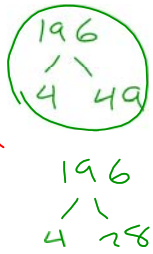
$7a^2 + 53a + 28$

$(7a+4)(a+7)$

$7a^2 + 49a + 4a + 28$

$7a^2 + 53a + 28$ ✓





	a	7
7a	$7a^2$	$49a$
4	$4a$	28

$9k^2 + 66k + 21$

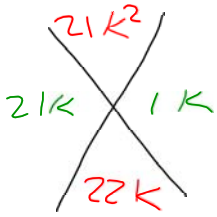
$3(3k^2 + 22k + 7)$

$3(3k+1)(k+7)$

$3(3k^2 + 21k + k + 7)$

$3(3k^2 + 22k + 7)$

$9k^2 + 66k + 21$ ✓



	3k	1
k	$3k^2$	$1k$
7	$21k$	7

Homework

pg. 484 #7-19 (odd)