

Name: _____

Date: _____

Notes

Algebra Section 9.5

Pages 583-589

Goal: “You will factor trinomials of the form $x^2 + bx + c$ ”



Factoring Trinomials:

Factoring a trinomial is essentially Un-Foiling.

Guess and Check:

Factor $x^2 + 11x + 18$

$$(x + 2)(x + 9)$$

Factor $x^2 + 8x + 12$

$$(x + 6)(x + 2)$$

Factor $x^2 + 5x + 4$

You are looking for factors of 4 that add to be 5.

$$4 \quad x \quad 1 = 4$$

$$4 \quad + \quad 1 = 5$$

$$\text{so... } (x + 4)(x + 1) = x^2 + 5x + 4$$

$$x^2 + bx + c = (x + p)(x + q)$$

Factor each trinomial:

Ex: $x^2 + 3x + 2$

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

Ex: $t^2 + 9t + 14$

$$(t + 7)(t + 2)$$

Ex: $t^2 + t - 20$

$$(t + 5)(t - 4)$$

Ex: $a^2 + 7a + 10$

$$(a + 5)(a + 2)$$

Ex: $x^2 + 13x + 12$

$$(x + 12)(x + 1)$$

Ex: $n^2 - 6n + 8$

$$(n - 4)(n - 2)$$

Ex: $x^2 - 4x + 3$

$(x - 3)(x - 1)$

Ex: $y^2 + 2y - 15$

$(y + 5)(y - 3)$

Solve:

Ex: $x^2 + 3x - 18 = 0$

$(x + 6)(x - 3) = 0$
 $x = -6$ or $x = 3$

Ex: $x^2 - 3x = 28$

$x^2 - 3x - 28 = 0$
 $(x - 7)(x + 4) = 0$
 $x = 7$ or $x = -4$

Factor completely.

Ex: $-x^2 - 6x - 5$

$-1(x^2 + 6x + 5)$

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

Ex: $-x^2 - 3x + 70$

$-1(x - 7)(x + 10)$

Ex: $2a^2 + 12a + 16$

Ex: $n^2 - 5n + 6$

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

Ex: $w^2 + 6w - 16$

$(w + 8)(w - 2)$

Ex: $s^2 - 2s = 24$

$s^2 - 2s - 24 = 0$
 $(s - 6)(s + 4) = 0$
 $s = 6$ or $s = -4$

Ex: $-x^2 - 4x - 3$

**Make $a = 1$ by factoring out a GCF of -1*

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

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

Ex: $-x^2 + 17x - 72$

$-1(x - 9)(x - 8)$

Ex: $3x^2 + 24x - 144$

$$2(a^2 + 6a + 8)$$
$$2(a + 4)(a + 2)$$

$$3(x^2 + 8x - 48)$$
$$3(x - 12)(x - 4)$$

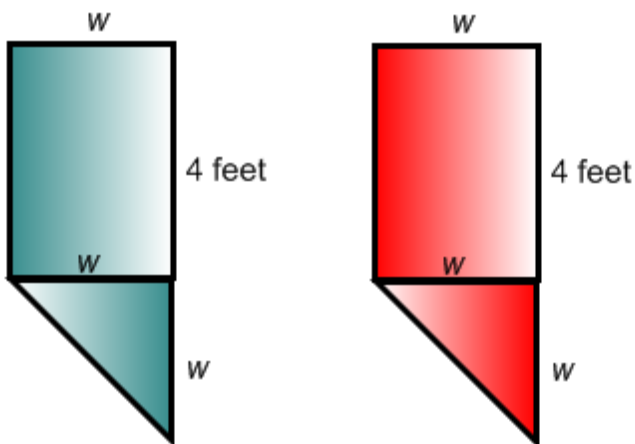
Ex: $4x^2 - 40x + 84$

Ex: $-2x^2 - 10x - 12$

$$4(x^2 - 10x + 21)$$
$$4(x - 3)(x - 7)$$

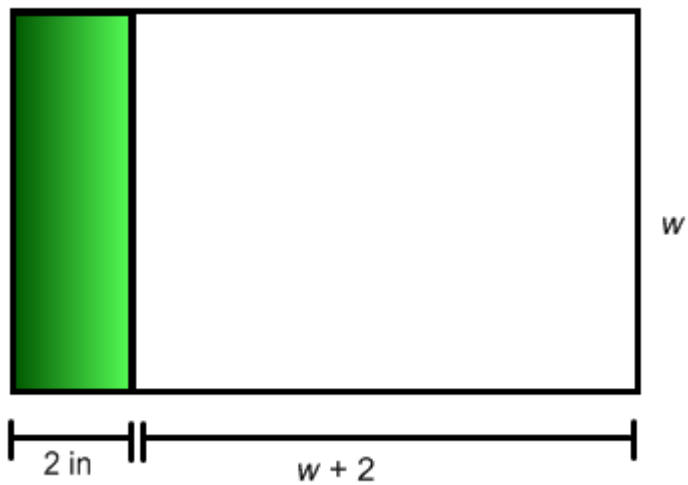
$$-2(x^2 + 5x + 6)$$
$$-2(x + 3)(x + 2)$$

Ex: You are making banners to hang during school spirit week. Each banner requires 16.5 square feet of felt and will be cut as shown. Find the width of each banner.



$$2(4w + \frac{1}{2} w^2) = 33$$
$$8w + w^2 = 33$$
$$w^2 + 8w - 33 = 0$$
$$(w + 11)(w - 3) = 0$$
$$w = -11 \text{ or } w = 3$$
$$w = 3 \text{ since it can't be negative}$$

Ex: You are designing a team flag. The shaded region will have the team name. The entire flag requires 117 square inches of fabric. Find the width.



$$\begin{aligned}w(w + 4) &= 117 \\w^2 + 4w - 117 &= 0 \\(w + 13)(w - 9) &= 0 \\w &= 9 \quad (\text{can't be } -13)\end{aligned}$$