

LESSON
8.6**Study Guide**For use with the lesson "Factor $ax^2 + bx + c$ "**GOAL** Factor trinomials of the form $ax^2 + bx + c$.**EXAMPLE 1** Factor when b is negative and c is positiveFactor $5n^2 - 12n + 7$.**Solution**

Because b is negative and c is positive, both factors of c must be negative. Make a table to organize your work.

You must consider the order of the factors of 7, because the x -terms of the possible factorization are different.

Factors of 5	Factors of 7	Possible factorization	Middle term when multiplied	
1, 5	-1, -7	$(n - 1)(5n - 7)$	$-5n - 7n = -12n$	← correct
1, 5	-7, -1	$(n - 7)(5n - 1)$	$-n - 35n = -36n$	X

$$5n^2 - 12n + 7 = (n - 1)(5n - 7)$$

EXAMPLE 2 Factor when b is negative and c is negativeFactor $3m^2 - 5m - 22$.**Solution**

Because b is negative and c is negative, p and q must have different signs.

Factors of 3	Factors of 22	Possible factorization	Middle term when multiplied	
1, 3	1, -22	$(m + 1)(3m - 22)$	$3m - 22m = -19m$	X
1, 3	-1, 22	$(m - 1)(3m + 22)$	$22m - 3m = 19m$	X
1, 3	2, -11	$(m + 2)(3m - 11)$	$-11m + 6m = -5m$	← correct
1, 3	-11, 2	$(m - 11)(3m + 2)$	$2m - 33m = -31m$	X

$$3m^2 - 5m - 22 = (m + 2)(3m - 11)$$

Exercises for Examples 1 and 2

Factor the trinomial.

1. $7a^2 - 50a + 7$

2. $4b^2 - 8b - 5$

3. $6c^2 + 5c - 14$

LESSON
8.6**Study Guide** *continued*
For use with the lesson "Factor $ax^2 + bx + c$ "**EXAMPLE 3** **Factor when a is negative****Factor** $-2x^2 + 9x - 9$.**Solution****STEP 1** Factor -1 from each term of the trinomial.

$$-2x^2 + 9x - 9 = -(2x^2 - 9x + 9)$$

STEP 2 Factor the trinomial $2x^2 - 9x + 9$. Because b is negative and c is positive, both factors of c must be negative. Use a table to organize information about the factors of a and c .

Factors of 2	Factors of 9	Possible factorization	Middle term when multiplied	
1, 2	-1, -9	$(x - 1)(2x - 9)$	$-9x - 2x = -11x$	X
1, 2	-9, -1	$(x - 9)(2x - 1)$	$-x - 18x = -19x$	X
1, 2	-3, -3	$(x - 3)(2x - 3)$	$-3x - 6x = -9x$	← correct

$$-2x^2 + 9x - 9 = -(x - 3)(2x - 3)$$

Exercises for Example 3**Factor the trinomial.**

4. $-3r^2 - 7r - 4$
5. $-3s^2 + 8s + 16$
6. $-8t^2 + 6t - 1$