

answers HW page 80

$$\begin{array}{c} 5 \\ \times \\ -6 \end{array}$$

1. $x^2 - 6x + 5$

~~$(x+6)(x-1)$~~
 $(x-5)(x-1)$

$$\begin{array}{c} 12 \\ \times \\ -8 \end{array}$$

2. $x^2 - 8x + 12$

$(x-2)(x-6)$

$$\begin{array}{c} -45 \\ \times \\ -4 \end{array}$$

3. $x^2 - 4x - 45$

$(x-9)(x+5)$

$$\begin{array}{c} -99 \\ \times \\ 2 \end{array}$$

4. $x^2 + 2x - 99$

$(x+11)(x-9)$

$$\begin{array}{c} 21 \\ \times \\ 10 \end{array}$$

5. $x^2 + 10x + 21$

$(x+7)(x+3)$

$$\begin{array}{c} -28 \\ \times \\ -3 \end{array}$$

6. $x^2 - 3x - 28$

$(x-7)(x+4)$

$$\begin{array}{c} 75 \\ \times \\ -20 \end{array}$$

11. $x^2 - 20x + 75$

$(x-15)(x-5)$

$$\begin{array}{c} -24 \\ \times \\ 8 \end{array}$$

12. $x^2 + 5x - 24$

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

$$\begin{array}{c} 8 \\ \times \\ -6 \end{array}$$

13. $x^2 - 6x + 8$

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

$$\begin{array}{c} 40 \\ \times \\ 10 \end{array}$$

14. $x^2 + 14x + 40$

$(x+10)(x+4)$

$$\begin{array}{c} -77 \\ \times \\ -4 \end{array}$$

15. $x^2 - 4x - 77$

$(x-11)(x+7)$

$$\begin{array}{c} 32 \\ \times \\ 8 \end{array}$$

16. $x^2 + 12x + 32$

$(x+8)(x+4)$

$\begin{array}{c} 12 \\ -3 \times -4 \\ -7 \end{array}$	7. $x^2 - 7x + 12$ $(x-3)(x-4)$	$\begin{array}{c} 3 \\ -3 \times -1 \\ -4 \end{array}$	17. $x^2 - 4x + 3$ $(x+4)(x-1)$ $(x-3)(x-1)$
$\begin{array}{c} -28 \\ -14 \times 2 \\ -12 \end{array}$	8. $x^2 - 12x - 28$ $(x-14)(x+2)$	$\begin{array}{c} 6 \\ -2 \times -3 \\ -5 \end{array}$	18. $x^2 - 5x + 6$ $(x-2)(x-3)$
$\begin{array}{c} 14 \\ 2 \times 7 \\ 9 \end{array}$	9. $x^2 + 9x + 14$ $(x+2)(x+7)$	$\begin{array}{c} -18 \\ -6 \times 3 \\ -3 \end{array}$	19. $x^2 - 3x - 18$ $(x-6)(x+3)$
$\begin{array}{c} 5 \\ 5 \times 1 \\ 6 \end{array}$	10. $x^2 + 6x + 5$ $(x+5)(x+1)$	$\begin{array}{c} -70 \\ 10 \times -7 \\ 3 \end{array}$	20. $x^2 + 3x - 70$ $(x+10)(x-7)$

Factor: $(6x^2 + 23x + 7)$

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

~~$\begin{array}{cc} 2 & 3 \\ \hline 23 \end{array}$~~



$(3x + 1)(2x + 7)$

page 143

8-6 Factoring Trinomials of the Type $ax^2 + bx + c$

Factoring a trinomial with a coefficient in front of the first term is a longer process. It requires careful thinking and checking. The following steps will lead you to the right answer for every problem of this kind.

Example 1: Factoring $ax^2 + bx + c$ **MUDSS Method**Factor: $6x^2 + 23x + 7$ Step 1: **M**ultiply.Step 2: **U**nfoil. (factor)Step 3: **D**ivide by the original leading coefficient.Step 4: **S**implify.Step 5: **S**lide.

Step 6: FOIL to check.

$$x^2 + 23x + 42$$

$$(x+2)(x+21)$$

$$\left(x + \frac{2}{6}\right)\left(x + \frac{21}{6}\right)$$

$$\left(x + \frac{1}{3}\right)\left(x + \frac{7}{2}\right)$$

$$(3x+1)(2x+7)$$

$$\begin{array}{r} 1 \backslash 42 \\ 2 \backslash 21 \\ 3 \backslash 14 \\ 6 \backslash 7 \end{array}$$

$$\begin{array}{r} 42 \\ 2 \backslash 21 \\ 23 \end{array}$$

It takes lots of practice to get comfortable with these problems.

✓ Understanding Check:

Factor:

a. $7x^2 + 9x + 2$

M: $x^2 + 9x + 14$
 U: $(x+2)(x+7)$
 D: $(x + \frac{2}{7})(x + \frac{7}{7})$
 S: $(x + \frac{2}{7})(x+1)$
 S: $(7x+2)(x+1)$

$\begin{array}{r} 14 \\ 2 \times 7 \\ \hline \end{array}$

$(7x+2)(x+1)$

b. $3x^2 - 7x - 6$

M: $x^2 - 7x - 18$
 U: $(x-9)(x+2)$
 D: $(x - \frac{9}{3})(x + \frac{2}{3})$
 S: $(x-3)(x + \frac{2}{3})$
 S: $(x-3)(3x+2)$

$\begin{array}{r} -18 \\ -9 \times 2 \\ \hline -7 \end{array}$

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

page 143 A

8-6 Factoring Trinomials of the Type $ax^2 + bx + c$

Factoring a trinomial with a coefficient in front of the first term is a longer process. It requires careful thinking and checking. The following steps will lead you to the right answer for every problem of this kind.

Example 1: Factoring $ax^2 + bx + c$

Step 1: **List the factors of the constant and leading coefficient.**

Step 2: **Set up:** $(\underline{\quad}x \underline{\quad})(\underline{\quad}x \underline{\quad})$

Step 3: **Guess and check!**

Step 4: **FOIL to check!**

Guess and Check Method

Factor: $6x^2 + 23x + 7$

Handwritten work for factoring $6x^2 + 23x + 7$:

Factors of 6: $\begin{matrix} +6 \\ -1, -2, -3, -6 \end{matrix}$ Factors of 7: $\begin{matrix} +7 \\ -1, -7 \end{matrix}$

Initial guess: $(1x + 1)(6x + 7)$ (crossed out)

Second guess: $(1x + 7)(6x + 1)$ (crossed out)

Third guess: $(2x + 1)(3x + 7)$ (crossed out)

Final answer: $(2x + 7)(3x + 1)$



When you want to factor quadratic trinomials...
Diamond, substitute, then you want to split the groups
Factor once, factor twice, then re-write it oh so nice!



It takes lots of practice to get comfortable with these problems!

✓ Understanding Check:

Factor:

a. $7x^2 + 9x + 2$

b. $3x^2 - 7x - 6$

$(7x+2)(x+1)$

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

Practice (Page 143B):

Factor each completely.

1) $3p^2 - 2p - 5$

2) $2n^2 + 3n - 9$

3) $3n^2 - 8n + 4$

4) $5n^2 + 19n + 12$

Homework: HW page 81

Factoring Trinomials: $ax^2 + bx + c$
(Long Diamond Method)

Name _____

Date _____ Per _____

1. $8x^2 + 10x + 3$

5. $6x^2 + 7x - 3$

2. $15x^2 + x - 6$

6. $2x^2 + 11x - 21$

A **red frame** is built around a 3 inches by 5 inches picture that extends an equal width on all sides of the picture. The area of the **red frame** is 63 in^2 . How far does the frame extend on each side of the picture?

