Name _____ Date _____ Class _____

LESSON 8-4

Practice B

Factoring $ax^2 + bx + c$

Factor each trinomial.

1. $2x^2 + 13x + 15$

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

3. $4x^2 + 24x + 27$

4. $5x^2 + 21x + 4$

5. $4x^2 + 11x + 7$

6. $6x^2 - 23x + 20$

7. $7x^2 - 59x + 24$

8. $3x^2 - 14x + 15$

9. $8x^2 - 73x + 9$

10. $2x^2 + 11x - 13$

11. $3x^2 + 2x - 16$

12. $2x^2 + 17x - 30$

13. $8x^2 + 29x - 12$

14. $11x^2 + 25x - 24$

15. $9x^2 - 3x - 2$

16. $12x^2 - 7x - 12$

17. $9x^2 - 49x - 30$

18. $6x^2 + x - 40$

19. $-12x^2 - 35x - 18$

20. $-20x^2 + 29x - 6$

21. $-2x^2 + 5x + 42$

22. The area of a rectangle is $20x^2 - 27x - 8$. The length is $4x + 1$. What is the width?

LESSON 8-4

Practice A

Factoring $ax^2 + bx + c$

Factor each trinomial, where *c* is positive.

1. $5x^2 + 17x + 6$ — $(1x + 3)(5x + 2)$
2. $4x^2 + 16x + 15$ — $(2x + 3)(2x + 5)$
3. $3x^2 + 17x + 20$ — $(3x + 6)(x + 4)$
4. $6x^2 + 19x + 10$ — $(3x + 2)(2x + 5)$
5. $8x^2 + 18x + 7$ — $(2x + 1)(4x + 7)$
6. $8x^2 + 19x + 3$ — $(2x + 3)(4x + 1)$
7. $4x^2 - 33x + 8$ — $(4x - 1)(1x - 8)$
8. $9x^2 - 27x + 14$ — $(3x - 7)(3x - 2)$
9. $6x^2 - 25x + 25$ — $(3x - 5)(2x - 5)$
10. $5x^2 - 22x + 8$ — $(5x - 2)(x - 4)$
11. $21x^2 - 22x + 5$ — $(7x - 5)(3x - 1)$
12. $12x^2 - 25x + 12$ — $(4x - 3)(3x - 4)$

Factor each trinomial, where *c* is negative.

13. $10x^2 + 13x - 9$ — $(5x + 9)(2x - 1)$
14. $3x^2 + x - 4$ — $(3x + 4)(1x - 1)$
15. $5x^2 + 7x - 6$ — $(x + 2)(5x - 3)$
16. $4x^2 - 9x - 9$ — $(4x + 3)(x - 3)$
17. $4x^2 - 12x - 7$ — $(2x + 1)(2x - 7)$
18. $6x^2 - 7x - 20$ — $(3x + 4)(2x - 5)$

Factor each trinomial, where *a* is negative.

19. $-5x^2 - 48x - 27$ — $-1(5x^2 + 48x + 27)$ — $-1(5x + 3)(1x + 9)$
20. $-6x^2 + 11x - 4$ — $-1(2x - 1)(3x - 4)$
21. $-20x^2 + 7x + 6$ — $-1(5x + 2)(4x - 3)$

22. The area of a rectangle is $8x^2 + 14x + 3$. The length is $2x + 3$. The width is $4x + 1$.

LESSON 8-4

Practice B

Factoring $ax^2 + bx + c$

Factor each trinomial.

1. $2x^2 + 13x + 15$ — $(2x + 3)(x + 5)$
2. $3x^2 + 10x + 8$ — $(3x + 4)(x + 2)$
3. $4x^2 + 24x + 27$ — $(2x + 9)(2x + 3)$
4. $5x^2 + 21x + 4$ — $(5x + 1)(x + 4)$
5. $4x^2 + 11x + 7$ — $(4x + 7)(x + 1)$
6. $6x^2 - 23x + 20$ — $(3x - 4)(2x - 5)$
7. $7x^2 - 59x + 24$ — $(7x - 3)(x - 8)$
8. $3x^2 - 14x + 15$ — $(3x - 5)(x - 3)$
9. $8x^2 - 73x + 9$ — $(8x - 1)(x - 9)$
10. $2x^2 + 11x - 13$ — $(2x + 13)(x - 1)$
11. $3x^2 + 2x - 16$ — $(3x + 8)(x - 2)$
12. $2x^2 + 17x - 30$ — $(x + 10)(2x - 3)$
13. $8x^2 + 29x - 12$ — $(x + 4)(8x - 3)$
14. $11x^2 + 25x - 24$ — $(x + 3)(11x - 8)$
15. $9x^2 - 3x - 2$ — $(3x + 1)(3x - 2)$
16. $12x^2 - 7x - 12$ — $(4x + 3)(3x - 4)$
17. $9x^2 - 49x - 30$ — $(9x + 5)(x - 6)$
18. $6x^2 + x - 40$ — $(3x + 8)(2x - 5)$
19. $-12x^2 - 35x - 18$ — $-1(4x + 9)(3x + 2)$
20. $-20x^2 + 29x - 6$ — $-1(5x - 6)(4x - 1)$
21. $-2x^2 + 5x + 42$ — $-1(2x + 7)(x - 6)$

22. The area of a rectangle is $20x^2 - 27x - 8$. The length is $4x + 1$. What is the width? $5x - 8$

LESSON 8-4

Practice C

Factoring $ax^2 + bx + c$

Factor each trinomial.

1. $6d^2 + 17d + 7$ — $(3d + 7)(2d + 1)$
2. $14x^2 - 27x + 9$ — $(7x - 3)(2x - 3)$
3. $16c^2 + 18c + 5$ — $(2c + 1)(8c + 5)$
4. $20b^2 + 21b - 5$ — $(4b + 5)(5b - 1)$
5. $12m^2 - 40m + 25$ — $(6m - 5)(2m - 5)$
6. $6x^2 + 13x - 28$ — $(2x + 7)(3x - 4)$
7. $-20x^2 - 57x - 27$ — $-1(5x + 3)(4x + 9)$
8. $4t^2 + 21t - 49$ — $(t + 7)(4t - 7)$
9. $15f^2 + 37f + 18$ — $(5f + 9)(3f + 2)$
10. $64h^2 - 28h - 15$ — $(16h + 5)(4h - 3)$
11. $15a^2 - 68a + 32$ — $(15a - 8)(a - 4)$
12. $-4x^2 - 8x + 45$ — $-1(2x + 9)(2x - 5)$
13. $6x^2 + 91x - 150$ — $(3x + 50)(2x - 3)$
14. $4x^2 + 13x + 10$ — $(4x + 5)(x + 2)$
15. $9k^2 - 18k + 8$ — $(3k - 4)(3k - 2)$
16. $24n^2 + 17n - 22$ — $(8n + 11)(3n - 2)$
17. $21x^2 - 16x - 16$ — $(7x + 4)(3x - 4)$
18. $18p^2 + 9p - 14$ — $(6p + 7)(3p - 2)$
19. $-13w^2 + 38w - 25$ — $-1(13w - 25)(w - 1)$
20. $12x^2 + 77x + 30$ — $(12x + 5)(x + 6)$
21. $12y^2 - 41y - 15$ — $(3y + 1)(4y - 15)$

22. The area of a parallelogram is $32x^2 + 28x - 15$. The base is $8x - 3$. What is the height? $4x + 5$

23. The area of a towel is $6x^2 - 11x - 72$ inches. What is the width if the length is $3x + 8$ inches? $2x - 9$ inches

LESSON 8-4

Reteach

Factoring $ax^2 + bx + c$

When factoring $ax^2 + bx + c$, first find factors of *a* and *c*. Then check the products of the inner and outer terms to see if the sum is *b*.

Factor $2x^2 + 11x + 15$. Check your answer.

$2x^2 + 11x + 15 = (\square x + \square)(\square x + \square)$

Factors of 2	Factors of 15	Outer + Inner
1 and 2	1 and 15	$1 \cdot 15 + 2 \cdot 1 = 17$ ✗
1 and 2	15 and 1	$1 \cdot 1 + 2 \cdot 15 = 31$ ✗
1 and 2	5 and 3	$1 \cdot 3 + 2 \cdot 5 = 13$ ✗
1 and 2	3 and 5	$1 \cdot 5 + 2 \cdot 3 = 11$ ✓

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

Check:

$(x + 3)(2x + 5) = 2x^2 + 5x + 6x + 15$
$= 2x^2 + 11x + 15$ ✓

Factor $3x^2 - 23x + 14$. Check your answer.

$3x^2 - 23x + 14 = (\square x + \square)(\square x + \square)$

Factors of 3	Factors of 14	Outer + Inner
1 and 3	−1 and −14	$1 \cdot (-14) + 3 \cdot (-1) = -17$ ✗
1 and 3	−14 and −1	$1 \cdot (-1) + 3 \cdot (-14) = -42$ ✗
1 and 3	−2 and −7	$1 \cdot (-7) + 3 \cdot (-2) = -13$ ✗
1 and 3	−7 and −2	$1 \cdot (-2) + 3 \cdot (-7) = -23$ ✓

$(x - 7)(3x - 2)$

Check:

$(x - 7)(3x - 2) = 3x^2 - 2x - 21x + 14$
$= 3x^2 - 23x + 14$ ✓

1. Factor $5x^2 + 12x + 4$ by filling in the blanks below.

Factors	Factors	Outer + Inner
1 and 5	1 and 4	$1 \cdot 4 + 5 \cdot 1 = 9$
1 and 5	4 and 1	$1 \cdot 1 + 5 \cdot 4 = 21$
1 and 5	2 and 2	$1 \cdot 2 + 5 \cdot 2 = 12$

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

Factor each trinomial.

2. $3x^2 + 7x + 4$ — $(3x + 4)(x + 1)$
3. $2x^2 - 13x + 21$ — $(2x - 7)(x - 3)$
4. $4x^2 + 8x + 3$ — $(2x + 3)(2x + 1)$