

Vocabulary and Core Concept Check

- REASONING** What is the greatest common factor of the terms of $3y^2 - 21y + 36$?
- WRITING** Compare factoring $6x^2 - x - 2$ with factoring $x^2 - x - 2$.

Monitoring Progress and Modeling with Mathematics

In Exercises 3–8, factor the polynomial. (See Example 1.)

- $3x^2 + 3x - 6$
- $8v^2 + 8v - 48$
- $4k^2 + 28k + 48$
- $6y^2 - 24y + 18$
- $7b^2 - 63b + 140$
- $9r^2 - 36r - 45$

In Exercises 9–16, factor the polynomial. (See Examples 2 and 3.)

- $3h^2 + 11h + 6$
- $8m^2 + 30m + 7$
- $6x^2 - 5x + 1$
- $10w^2 - 31w + 15$
- $3n^2 + 5n - 2$
- $4z^2 + 4z - 3$
- $8g^2 - 10g - 12$
- $18v^2 - 15v - 18$

In Exercises 17–22, factor the polynomial. (See Example 4.)

- $-3t^2 + 11t - 6$
- $-7v^2 - 25v - 12$
- $-4c^2 + 19c + 5$
- $-8h^2 - 13h + 6$
- $-15w^2 - w + 28$
- $-22d^2 + 29d - 9$

ERROR ANALYSIS In Exercises 23 and 24, describe and correct the error in factoring the polynomial.

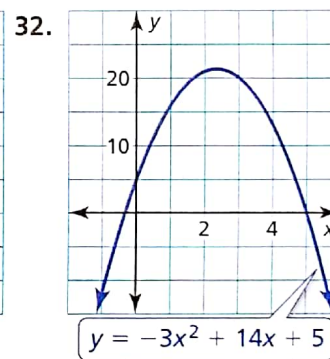
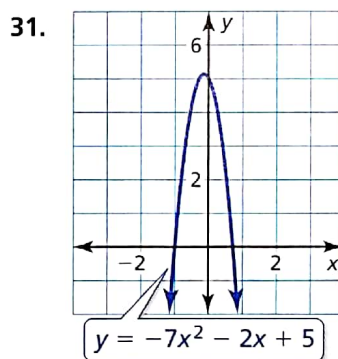
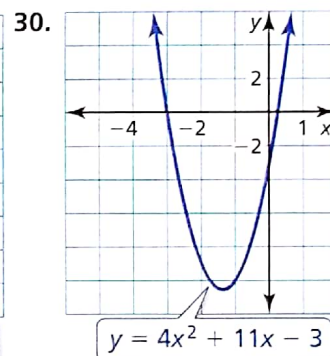
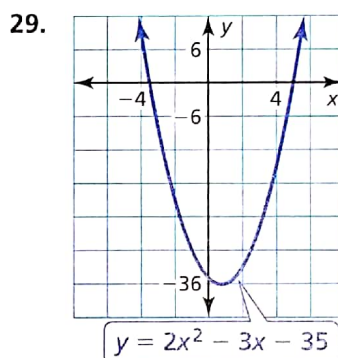
23. $2x^2 - 2x - 24 = 2(x^2 - 2x - 24)$
 $= 2(x - 6)(x + 4)$

24. $6x^2 - 7x - 3 = (3x - 3)(2x + 1)$

In Exercises 25–28, solve the equation.

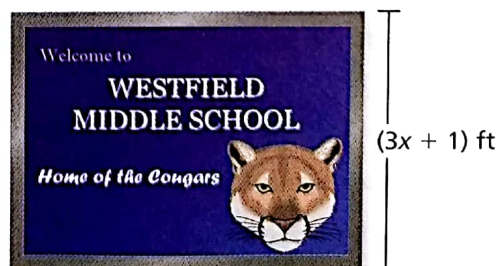
- $5x^2 - 5x - 30 = 0$
- $2k^2 - 5k - 18 = 0$
- $-12n^2 - 11n = -15$
- $14b^2 - 2 = -3b$

In Exercises 29–32, find the x -coordinates of the points where the graph crosses the x -axis.



33. **MODELING WITH MATHEMATICS** The area (in square feet) of the school sign can be represented by $15x^2 - x - 2$.

- Write an expression that represents the length of the sign.
- Describe two ways to find the area of the sign when $x = 3$.



Vocabulary and Core Concept Check

- WRITING** You are factoring $x^2 + 11x - 26$. What do the signs of the terms tell you about the factors? Explain.
- OPEN-ENDED** Write a trinomial that can be factored as $(x + p)(x + q)$, where p and q are positive.

Monitoring Progress and Modeling with Mathematics

In Exercises 3–8, factor the polynomial. (See Example 1.)

- | | |
|---------------------|---------------------|
| 3. $x^2 + 8x + 7$ | 4. $z^2 + 10z + 21$ |
| 5. $n^2 + 9n + 20$ | 6. $s^2 + 11s + 30$ |
| 7. $h^2 + 11h + 18$ | 8. $y^2 + 13y + 40$ |

In Exercises 9–14, factor the polynomial. (See Example 2.)

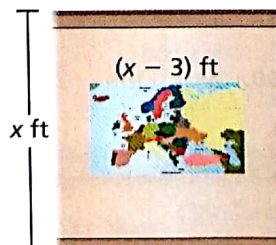
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|----------------------|----------------------|
| 9. $v^2 - 5v + 4$ | 10. $x^2 - 13x + 22$ |
| 11. $d^2 - 5d + 6$ | 12. $k^2 - 10k + 24$ |
| 13. $w^2 - 17w + 72$ | 14. $j^2 - 13j + 42$ |

In Exercises 15–24, factor the polynomial. (See Example 3.)

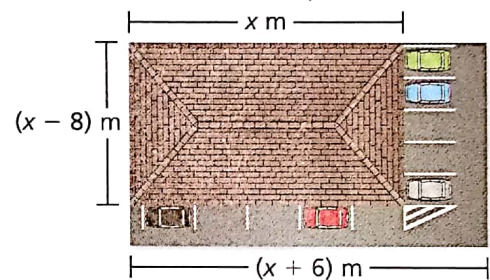
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| 15. $x^2 + 3x - 4$ | 16. $z^2 + 7z - 18$ |
| 17. $n^2 + 4n - 12$ | 18. $s^2 + 3s - 40$ |
| 19. $y^2 + 2y - 48$ | 20. $h^2 + 6h - 27$ |
| 21. $x^2 - x - 20$ | 22. $m^2 - 6m - 7$ |
| 23. $-6t - 16 + t^2$ | 24. $-7y + y^2 - 30$ |

25. **MODELING WITH MATHEMATICS** A projector displays an image on a wall. The area (in square feet) of the projection is represented by $x^2 - 8x + 15$.

- Write a binomial that represents the height of the projection.
- Find the perimeter of the projection when the height of the wall is 8 feet.



26. **MODELING WITH MATHEMATICS** A dentist's office and parking lot are on a rectangular piece of land. The area (in square meters) of the land is represented by $x^2 + x - 30$.



- Write a binomial that represents the width of the land.
- Find the area of the land when the length of the dentist's office is 20 meters.

ERROR ANALYSIS In Exercises 27 and 28, describe and correct the error in factoring the polynomial.

27.



$$x^2 + 14x + 48 = (x + 4)(x + 12)$$

28.



$$s^2 - 17s - 60 = (s - 5)(s - 12)$$

In Exercises 29–38, solve the equation.

- | | |
|---------------------------|--------------------------|
| 29. $m^2 + 3m + 2 = 0$ | 30. $n^2 - 9n + 18 = 0$ |
| 31. $x^2 + 5x - 14 = 0$ | 32. $y^2 + 11y - 26 = 0$ |
| 33. $t^2 + 15t = -36$ | 34. $n^2 - 5n = 24$ |
| 35. $a^2 + 5a - 20 = 30$ | 36. $y^2 - 2y - 8 = 7$ |
| 37. $m^2 + 10 = 15m - 34$ | 38. $b^2 + 5 = 8b - 10$ |