



Factor the polynomial.

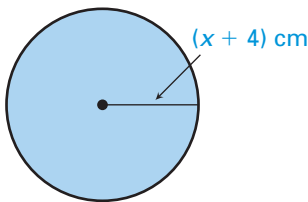
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|--------------------------|---------------------------|-----------------------------|
| 1. $x^2 - 36$ | 2. $25p^2 - 144$ | 3. $4b^2 - 100$ |
| 4. $36m^2 - 81$ | 5. $-2x^2 + 32$ | 6. $-4r^2 + 100s^2$ |
| 7. $y^2 + 24y + 144$ | 8. $9c^2 + 24c + 16$ | 9. $25w^2 - 20w + 4$ |
| 10. $16n^2 - 56n + 49$ | 11. $-18a^2 - 12a - 2$ | 12. $20z^2 - 140z + 245$ |
| 13. $x^2 - 18xy + 81y^2$ | 14. $9x^2 - 30xy + 25y^2$ | 15. $16x^2 + 80xy + 100y^2$ |

Solve the equation.

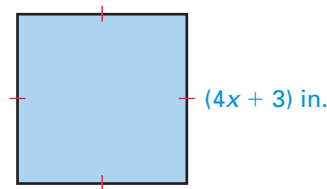
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|----------------------------|---|----------------------------|
| 16. $x^2 + 14x + 49 = 0$ | 17. $8w^2 = 50$ | 18. $64p^2 - 16p + 1 = 0$ |
| 19. $8a^2 - 72 = 0$ | 20. $3m^2 + 30m + 75 = 0$ | 21. $-4y^2 + 32y - 64 = 0$ |
| 22. $-5x^2 + 125 = 0$ | 23. $-7r^2 + 140r - 700 = 0$ | 24. $24w^2 - 24w + 6 = 0$ |
| 25. $18n^2 + 60n + 50 = 0$ | 26. $\frac{25}{2}x^2 + 15x + \frac{9}{2} = 0$ | 27. $4x^2 = \frac{9}{16}$ |

Find the value of x in the geometric shape.

28. Area = $144\pi \text{ cm}^2$



29. Area = 225 in.^2

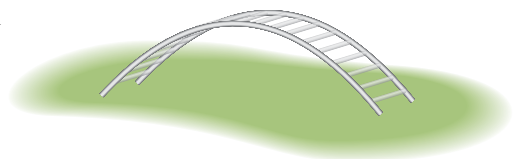


30. **Measuring Tape** A measuring tape drops from a roof that is 16 feet above the ground. After how many seconds does the measuring tape land on the ground?

31. **Multiple Representations** A curved ladder that children can climb on can be modeled by the equation

$$y = -\frac{1}{20}x^2 + x$$

where x and y are measured in feet.



- Making a Table** Make a table of values that shows the height of the ladder for $x = 0, 5, 10, 15,$ and 20 feet from the left end.
- Interpreting an Equation** For what additional values of x does the equation make sense? *Explain.*
- Drawing a Graph** Plot the ordered pairs in the table from part (a) as points in a coordinate plane. Connect the points with a smooth curve.
- Interpreting a Graph** At approximately what distance from the left end does the ladder reach a height of 5 feet? Check your answer algebraically.



Factor the polynomial.

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| 1. $25x^2 - 81$ | 2. $225p^2 - 100$ | 3. $121w^2 - 625$ |
| 4. $36m^2 - 64$ | 5. $\frac{9}{16}r^2 - \frac{1}{16}$ | 6. $81x^2 - 49y^2$ |
| 7. $-3y^2 - 48y - 192$ | 8. $4n^2 - 40n + 100$ | 9. $12z^2 + 12z + 3$ |
| 10. $24a^2 - 120ab + 150b^2$ | 11. $-18s^2 - 48st - 32t^2$ | 12. $5z^2 + 2z + \frac{1}{5}$ |

13. **Error Analysis** Describe and correct the error in factoring the polynomial $y^2 - 10y + 25$.

$$y^2 - 10y + 25 = y^2 - 2(y \cdot 5) + 5^2$$

$$= (y - 5)(y + 5)$$



Solve the equation.

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|-------------------------------|--|------------------------------|
| 14. $25m^2 - 64 = 0$ | 15. $2p^2 + 36p + 162 = 0$ | 16. $-16r^2 + 196 = 0$ |
| 17. $3w^2 - 60w + 300 = 0$ | 18. $36x^2 - 132x + 121 = 0$ | 19. $225a^2 - 120a + 16 = 0$ |
| 20. $-75y^2 - 90y - 27 = 0$ | 21. $196n^2 - 224n + 64 = 0$ | 22. $160z^2 = 640$ |
| 23. $0.9r^2 - 4.8r + 6.4 = 0$ | 24. $\frac{25}{2}b^2 + 5b + \frac{1}{2} = 0$ | 25. $-96d^2 + 144d - 54 = 0$ |

Determine the value(s) of k that make the expression a perfect square trinomial.

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|-----------------------|------------------------|--------------------------|
| 26. $81x^2 + kx + 25$ | 27. $100x^2 + kx + 49$ | 28. $25x^2 - 60x + k$ |
| 29. $kx^2 + 72x + 81$ | 30. $4x^2 - 12x + k$ | 31. $49x^2 + kxy + 4y^2$ |

32. **Squirrel** A squirrel jumps straight up with an initial vertical velocity of 16 feet per second. How many times does the squirrel reach a height of 4 feet? *Explain* your answer.

33. **Multiple Representations** A foot bridge that spans a small creek can be modeled by the equation

$$y = -\frac{3}{800}x^2 + \frac{3}{10}x$$



where x and y are measured in feet.

- Making a Table** Make a table of values that shows the height of the bridge for $x = 0, 20, 40, 60,$ and 80 feet from the left end.
- Interpreting an Equation** For what additional values of x does the equation make sense? *Explain.*
- Drawing a Graph** Plot the ordered pairs in the table from part (a) as points in a coordinate plane. Connect the points with a smooth curve.
- Interpreting a Graph** At approximately what distance from the left end does the bridge reach a height of 6 feet? Check your answer algebraically.