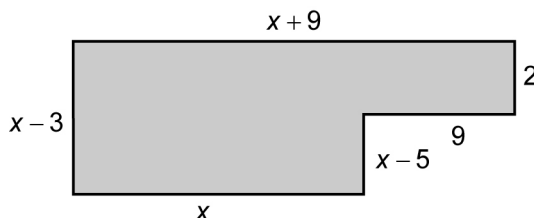


## Chapter 5 Review

### 5.1 Multiply Polynomials

- Use the distributive property to find each binomial product.
  - $(x + 7)(x + 3)$
  - $(y - 3)(y + 5)$
  - $(x - 3y)(x + 2y)$
  - $(3a + 8b)(5a + 6b)$
- Expand and simplify.
  - $-4(a + 6)(a - 3)$
  - $-3x(x + 2y)(x + 6y)$
  - $(10y + 6)(3y + 7) - (y + 2)(y - 4)$
  - $2b(4b - 7)(3b + 2) - b(5b + 2)(b - 6)$
  - $-x(x + y)(2x + y) - y(3x + y)(x - y)$
- A parabola has equation  $y = 2(x - 3)(x - 6)$ .
  - Expand and simplify the right side of the equation.
  - State the  $x$ -intercepts of the parabola.
  - Verify in the expanded form that these are the  $x$ -intercepts.
- Write a simplified algebraic expression to represent the area of the figure.



- Expand and simplify your expression from part a).

### 5.2 Special Products

- Draw a diagram to illustrate each product.
  - $(x + 5)^2$
  - $(y + 3)^2$
- Expand and simplify.
  - $(x + 6)^2$
  - $(r - 3)^2$
  - $(y + 10)^2$
  - $(e - 5)^2$
- Expand and simplify.
  - $(b + 9)(b - 9)$
  - $(y - 11)(y + 11)$
  - $(m + 13)(m - 13)$
  - $(14 - x)(14 + x)$

- Expand and simplify.

- $(x - 3y)^2$
- $-5(2x + 5b)^2$
- $(11x - 13y)(11x + 13y)$
- $-(a - 6b)(a + 6b)$

- A square has side length  $4a$ . One dimension is increased by 6 and the other is decreased by 6.

- Write an algebraic expression to represent the area of the resulting rectangle.
- Expand this expression and simplify.
- Write and simplify an algebraic expression for the change in area from the square to the rectangle.
- Calculate the new area of the rectangle if  $a$  represents 5 cm.

### 5.3 Common Factors

- Use algebra tiles or a diagram to illustrate the factoring of each polynomial.

- $x^2 + 5x$
- $8x^2 + x$

- Factor.

- $2x^2 + 4x$
- $5x^2 + 3x$
- $10x^2 + 20y^2$
- $3xy - 7xz$

- Factor by grouping.

- $2x^2 + 2x + 3xy + 3y$
- $x^3 + x^2y + yx + y^2$
- $5ab - 5a + 3b - 3$
- $3a^2x + 3a^2y + b^2x + b^2y$

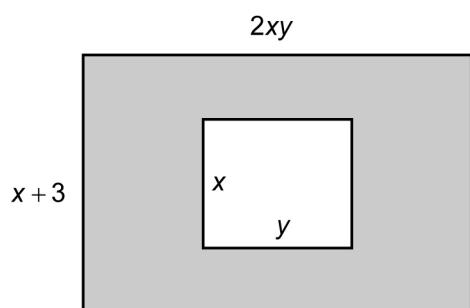
- Factor, if possible.

- $2z(x + y) + 3xy(x + y)$
- $x^2 + y^2 + z^2$
- $6a^3 + 3a^2 + 12a + 6$
- $x^2yz^2 - x^2z^2 + xyz$

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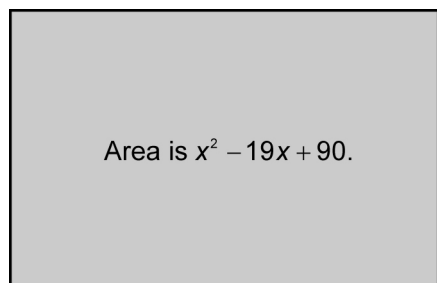
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14. Write an expression in fully factored form for the shaded area.



**5.4 Factor Quadratic Expressions of the Form  $x^2 + bx + c$**

15. Illustrate the factoring of each trinomial using algebra tiles or a diagram.
- $x^2 + 6x + 9$
  - $x^2 + 12x + 35$
16. Factor.
- $x^2 - 4x - 12$
  - $x^2 - 7x + 12$
  - $x^2 - 4x - 45$
  - $x^2 + 9x + 14$
17. Factor completely by first removing the greatest common factor (GCF).
- $-2x^2 + 16x - 30$
  - $x^3 + 3x^2 - 28x$
18. Determine binomials to represent the length and width of the rectangle, and then determine the dimensions of the rectangle if  $x = 11$  cm.



**5.5 Factor Quadratic Expressions of the Form  $ax^2 + bx + c$**

19. Factor, using algebra tiles or a diagram if necessary.
- $12x^2 - 5x - 3$
  - $3x^2 - 13x - 10$
  - $10x^2 + 9x - 7$
  - $21x^2 + 4x - 1$
20. Factor, if possible.
- $3x^2 + 15y + 33$
  - $2x^2 + 7x + 9$
  - $30x^2 + 9x - 12$
  - $-6x^2 - 34x + 12$
21. Find a value of  $k$  so that each trinomial can be factored over the integers.
- $3x^2 + kx - 10$
  - $24x^2 + 47x + k$
- 5.6 Factor a Perfect Square Trinomial and a Difference of Squares**
22. Factor fully.
- $x^2 - 100$
  - $c^2 - 25$
  - $9x^2 - 16$
  - $128 - 18x^2$
  - $1 - 225y^2$
  - $-3x^2 + 27y^2$
23. Verify that each trinomial is a perfect square, and then factor.
- $y^2 + 16y + 64$
  - $x^2 - 20x + 100$
  - $225 - 90y + 9y^2$
  - $121c^2 + 308cd + 196d^2$
24. Factor, if possible.
- $9y^2 + 24y - 16$
  - $50x^2 - 60xy + 18y^2$
  - $(x - 3)^2 - (y - 4)^2$
  - $x^2 + 9y^2$
25. A rectangular prism has a volume of  $4x^3 + 12x^2 + 9x$ .
- Determine algebraic expressions for the dimensions of the prism.
  - Describe the faces of the prism.
  - Determine the volume if  $x = 3$  cm.
  - Determine the surface area if  $x = 3$  cm.