

5 Review

5.1 Multiplying Polynomials, pages 204–213

1. Draw a diagram to model each product.

a) $(x + 5)(x - 3)$

b) $(y + 3)^2$

2. Determine the product and then combine like terms.

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

b) $(b + 9)(b - 9)$

c) $(y - 11)(y + 11)$

d) $(3a + 8b)(5a + 6b)$

e) $-5(2x + 5b)^2$

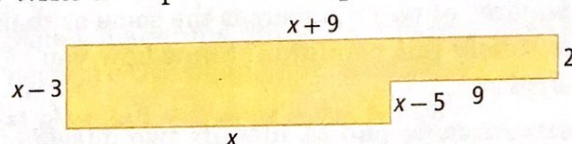
f) $-(a - 6b)(a + 6b)$

3. Multiply and then combine like terms.

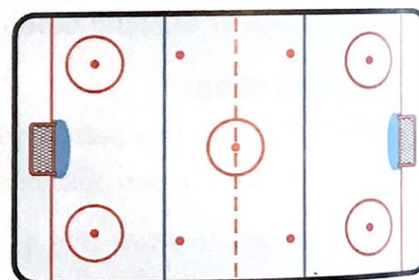
a) $(a^2 + 6a + 2)(a - 3)$

b) $2b(4b - 7)(3b + 2) - b(5b + 2)(b - 6)$

4. Write an expression to represent the area of the figure. Simplify.



5. The length of the ice surface of a hockey rink is represented by $5x + 25$. The width is represented by $2x + 10$. What expression represents the area of the ice surface?



5.2 Common Factors, pages 214–223

6. Identify the GCF of each set of terms.

a) 16 and 64

b) 81 and 108

c) 144, 60, and 54

d) $2x^2$ and $4x$

e) $10x^2$ and $20y^2$

f) $3xy$ and $7xz$

7. Identify the LCM of the following pairs of numbers.

a) 18 and 27

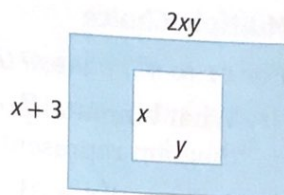
b) 125 and 15

8. Use algebra tiles or a diagram to factor each polynomial.

a) $x^2 + 5x$

b) $8x^2 + x$

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



5.3 Factoring Trinomials, pages 224–237

10. Use algebra tiles or a diagram to factor each trinomial.

a) $x^2 + 6x + 9$

b) $x^2 + 12x + 35$

c) $12x^2 - 5x - 3$

d) $3x^2 - 13x + 10$

11. Factor, if possible.

a) $x^2 - 4x - 12$

b) $x^2 - 7x + 12$

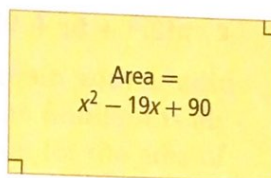
c) $30x^2 + 9x - 12$

d) $-6x^2 - 34x + 12$

e) $-2x^2 + 16x - 30$

f) $x^3 + 3x^2 - 28x$

12. Identify binomials to represent the length and width of the rectangle. Then, calculate the dimensions of the rectangle if $x = 11$ cm.



5.4 Factoring Special Trinomials, pages 238–251

13. Factor fully.

a) $x^2 - 100$

b) $c^2 - 25$

c) $9x^2 - 16$

d) $128 - 18x^2$

e) $1 - 225y^2$

f) $-3x^2 + 27y^2$

14. Verify that each trinomial is a perfect square. Then, factor.

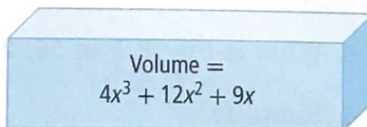
a) $y^2 + 16y + 64$

b) $x^2 - 20x + 100$

c) $225 - 90y + 9y^2$

d) $121c^2 + 308cd + 196d^2$

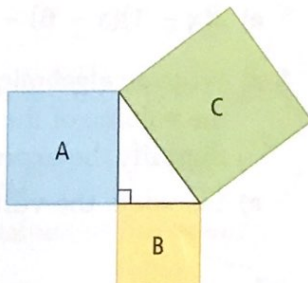
15. a) Write algebraic expressions for the dimensions of the rectangular prism.



- b) Describe the faces of the prism.

- c) Calculate the surface area if $x = 3$ cm.

16. The expression x^2 represents the area of square A, y^2 the area of square B, and $x^2 + y^2$ the area of square C. The side lengths of squares A and B are increased by 2 units. Write an expression for the new area of square C.



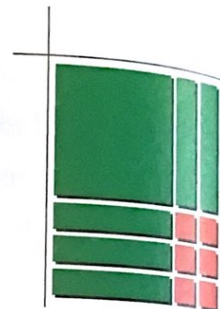
5 Practice Test

Multiple Choice

For #1 to #5, choose the best answer.

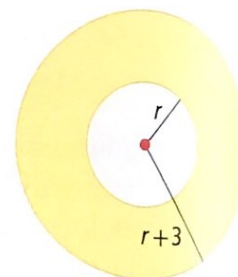
1. What binomial product does the diagram represent?

A $(x + 2)(x + 3)$ B $(x + 2)(x - 3)$
C $(x - 2)(x - 3)$ D $(x - 2)(x + 3)$



2. What is an algebraic expression for the area of the shaded region?

A $\pi(r^2 - 9)$ B $3\pi(2r + 3)$
C $\pi(2r^2 + 6r + 9)$ D 9π



3. Fully factored, $8m^2 + 16m - 10$ can be represented as

A $2(2m - 1)(2m + 5)$ B $2(4m + 10)(2m - 5)$
C $(4m^2 + 20)(2m - 4)$ D $(4m - 2)(2m + 5)$

4. Fully factored, $4y^2 - 64$ can be represented as

A $y(y^2 - 16)$ B $4(y - 4)^2$
C $4(y - 4)(y + 4)$ D $4(y - 2)(y + 2)$

Short Answer

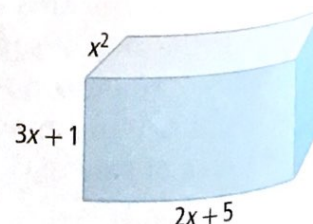
5. What is the GCF of 56, 20, and 228? What is their LCM?

6. Simplify.

a) $(x - 3)(x - 9)$ b) $(2x + 3)(2x - 1)$
c) $-3(x - 4)^2 + 2(x - 3)(x + 3)$ d) $(3c + d)^2 + 2c(c - d)$
e) $2(x - 1)(x - 6) - 3(2x - 1)^2$ f) $(2c + 3d)^2 - 3(c + 1)^2$

7. a) Write an algebraic expression for the volume of the rectangular prism. Simplify the expression.

- b) Calculate the volume if $x = 2$ cm.



8. Factor fully.

a) $x^2 + 10x + 25$

b) $25r^2 - 20rs + 4s^2$

c) $5x^2 - 5$

d) $1 - 49m^2$

e) $5m^2 + 17m + 6$

f) $m^2 - 9mn + 14n^2$

9. Factor, if possible.

a) $3y^3 - 7y^2 + 2y$

b) $4m^2 + 16$

c) $6y^2 + y - 1$

d) $x(m - 2) - 4(m - 2)$

e) $y^2 + 2x + 2y + xy$

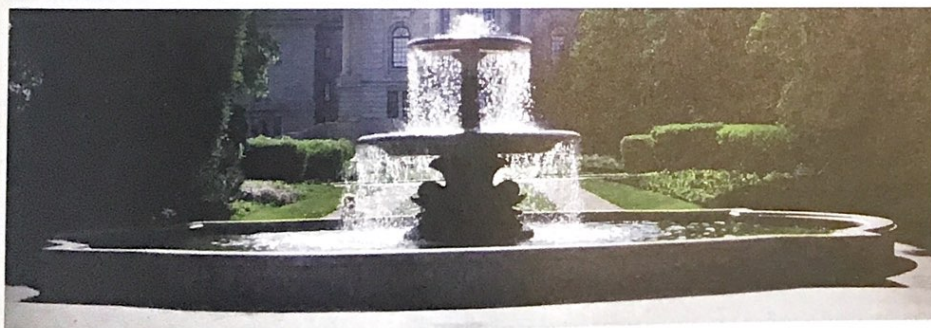
f) $9t - 4t^3$

10. The face of a Canadian \$20 bill has an area that can be represented by the expression $10x^2 + 9x - 40$.

a) Factor $10x^2 + 9x - 40$ to find expressions to represent the dimensions of the bill.

b) If x represents 32 mm, what are the dimensions of the bill? Express your answer in millimetres.

11. Trafalgar Fountain in Regina is a circular fountain with a radius of $2x$ metres. The circular pool surrounding the fountain is an additional 3 m in radius. What is an expression for the area of the base of the pool? Multiply and combine like terms.



Did You Know?

Trafalgar Fountain is one of a pair of fountains made in London, England. The fountain in Regina commemorates the founding of the Northwest Mounted Police headquarters in 1882. The other fountain is located in Ottawa.

Extended Response

12. Brendan factored the trinomial $8y^2 - 12y - 18$ in this way:

$$\begin{aligned} 8y^2 - 12y - 18 &= 2(4y^2 - 6y - 9) \\ &= 2(2y - 3)(2y + 3) \\ &= 2(2y - 3)^2 \end{aligned}$$

Is Brendan's factoring correct? Explain.

13. The volume of a rectangular prism is represented by $12x^3 - 3x$.

a) Factor the expression fully.

b) Sketch the prism and label its dimensions.

c) If x represents 6 cm, what are the dimensions of the prism?