CHAPTER **1**

Algebraic Reasoning

Multiple Choice Test A

Choose the best answer.

1. Simplify the expression
   $2 \times 36 - 24 \div 6$.

   A 8   C 68

   B 64   D 4

2. Simplify the expression $87 - 6 + 9 \div 3^2$.

   A 10   C 82

   B 84   D 81

3. Simplify the expression
   $18 + 4(6 - 2^2) - 2$.

   A 36   C 80

   B 272   D 24

4. Simplify the expression
   $16 + (4 \times 6) - 3^2$.

   A 31   C 111

   B 49   D 961

5. Which expression simplifies to 5?

   A $4 + 9 \div 3 - 2$

   B $60 - 5 \times 11 + 7$

6. Which is an example of the
   Commutative Property of
   Multiplication?

   A $1 + 7 = 7 + 1$

   B $(2 \times 4) \times 5 = 5 \times (4 \times 2)$

   C $12 \times 1 = 12$

   D $4 \times 8 = 8 \times 4$

7. $284 + 0 = 284$ is an example of which
   property?

   A Commutative   C Associative

   B Identity   D Distributive

8. $1 \times (3 + 7) = (1 \times 3) + (1 \times 7)$ is an
   example of which property?

   A Associative   C Distributive

   B Commutative   D Identity

9. $(p \times q) \times r = p \times (q \times r)$ is an example of
   which property?

   A Identity Property

   B Distributive Property

   C Associative Property

   D Commutative Property

10. $13 \times 1 = 13$ is an example of which
    property?

    A Distributive Property

    B Associative Property

    C Identity Property

    D Commutative Property

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11. Which expression is equal to 4?

    A $t - 5$ for $t = 10$

    B $2t + 1$ for $t = 2$

    C $2 + t$ for $t = 4$

    D $t \div 4$ for $t = 16$

12. Evaluate $4x^2 + 4x$ for $x = 3$.

    A 26   C 24

    B 36   D 48

13. Evaluate $5a - 2 \times a$ for $a = 6$.

    A 18   C 168

    B 120   D 28

14. Evaluate $\dfrac{18}{n} - 3m$ for $n = 2$ and

    $m = 3$.

    A 0   C 27

    B 18   D 9

15. Evaluate $4 + 3p^2 - c$ for $p = 2$ and
    $c = 8$.

    A 2   C 16

    B 8   D 24

16. Which phrase represents $n \div 12$?

    A the quotient of a number and 12

    B the product of a number and 12

17. Which expression is equal to "nine
    less than the product of 7 and b"?

    A $9 - 7b$ C $7b \times 9$

    B $9b - 7$ D $7b - 9$

18. Which expression is equal to "three
    less than a number multiplied by six"?

    A $6(x - 3)$ C $3 - 6x$

    B $6x - 3$ D $6 - 3x$

19. Which phrase represents the
    expression $3x + 9$?

    A three times nine plus a number

    B a number multiplied by three then
       added to nine

20. Which expression is equal to
    $3a + 6b - a - 3b$?

    A $2a + 3b$

    B $4a + 9b$

21. Which expression is equivalent to
    $4x + x^2 - 4x$?

    A $8x - x^2$

    B x^2

22. Simplify $n^2 - n + 3n^2 + 17 - n$.

    A $4n^2 - 2n + 17$ C $3n^2 - 2n + 17$

    B $3n + 17$ D $3n^2 + 17$

23. The side length of an equilateral
    triangle is $3x - 2$. Which expression
    represents the perimeter of the
    triangle?

    A $3x - 2$ C $9x - 6$

    B $9x - 8$ D $6x - 5$

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CHAPTER 1 Algebraic Reasoning
Multiple Choice Test B

Choose the best answer.

1. Simplify the expression $4 \times 8 - 6 \div 2$.

   A 8   C 29

   B 22   D 4

2. Which expression simplifies to 56?

   F $7 + 3 \times 6 - 4$

   G $70 - 5 \div 3 + 8$

   H $42 \div (6 \times 8)$

   J $60 - (12 \div 4 + 1)$

3. Simplify the expression $2 \times 4^2 - 8 \div 4$.

   A 30   C 4

   B 24   D 6

4. Simplify the expression
   $23 + 3(12 - 3^2) - 2$.

   F 264   H 301

   G 30   J 1,110

5. Simplify the expression
   $(6 - 1)^2 \times (5 - 3)^2 \div 4$.

   A 140   C 3,721

   B 29   D 25

6. $648 \times 1 = 648$ is an example of which property?

   F Commutative Property

   G Identity Property

   H Associative Property

   J Distributive Property

7. Which is an example of the Commutative Property of Multiplication?

   A $72 + 9 = 9 + 72$

   B $(8 \times 7) \times 4 = 8 \times (7 \times 4)$

   C $57 \times 1 = 57$

   D $38 \times 5 = 5 \times 38$

8. $9 \times (6 + 4) = (9 \times 6) + (9 \times 4)$ is an example of which property?

   F Associative   H Distributive

   G Commutative   J Identity

9. $(x \times y) \times z = x \times (y \times z)$ is an example of which property?

   A Identity Property

   B Distributive Property

   C Associative Property

   D Commutative Property

10. $77 + 0 = 77$ is an example of which property?

   F Distributive Property

   G Associative Property

   H Identity Property

   J Commutative Property

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CHAPTER **Algebraic Reasoning**

1 **Multiple Choice Test B, continued**

11. Evaluate $6z^2 - 9z$ for $z = 2$.

  A 6   C 558

  B 126   D 18

12. Evaluate $5a - 2 \times a$ for $a = 6$.

  F 18   H 168

  G 120   J 28

13. Evaluate $\dfrac{108}{x} \div 3y$ for $x = 9$ and

  $y = 3$.

  A 12   C 27

  B 18   D 9

14. Which expression is equal to 17?

  F $t - 9$ for $t = 26$

  G $2t + 1$ for $t = 7$

  H $6 + t$ for $t = 23$

  J $t \div 4$ for $t = 48$

15. Evaluate $7 + 2p^2 - 3c$ for $p = 4$
    and $c = 2$.

  A 3   C 33

  B 9   D 65

16. Which phrase represents $t \times 33$?

  F the quotient of a number and 33

  G the product of a number and 33

  H the quotient of 33 and a number

  J the difference of a number and 33

17. Which expression is equal to "13 more
    than the quotient of n and 8"?

  A $13n \div 8$ C $n \times 8 + 13$

  B $n - 8 + 13$ D $n \div 8 + 13$

18. Which expression is equal to "five
    less than a number multiplied by 3"?

  F $3(x - 5)$ H $5 - 3x$

  G $5x - 3$ J $3x - 5$

19. Which phrase represents the
    expression $7x + 2$?

  A seven times two plus a number

  B two times a number plus seven

  C two less than a number multiplied
     by seven

  D a number multiplied by seven then
     added to two

20. Which expression is equivalent to
    $6x + 3x^2 - 4x$?

  F $3x^2 + 10x$ H $2x - 3x^2$

  G $2x + 3x^2$ J $3x^2 - 2x$

21. Which expression is equal to
    $12 + 5t - 4 + 15t + 1$?

  A $28t + 1$ C $28t + 9$

  B $9 + 20t$ D $20t + 1$

22. Simplify $3p^2 - 2q + 2p^2 + 17 - q$?

  F $p^2 - 3q + 17$

  G $5p^2 - 3q + 17$

  H $p^2 - q + 17$

  J $5p^2 - q + 17$

23. The side length of an equilateral
    triangle is $4x - 5$. Which expression
    represents the perimeter of the
    triangle?

  A $4x - 15$ C $12x - 15$

  B $12x - 5$ D $7x - 8$

CHAPTER **Algebraic Reasoning**

1 **Free Response Test C**

1. Simplify the expression
   $66 - 6 \div 3 \times 2 + 8$.

   _____

2. Simplify the expression
   $(16 - 5) \times 7 + 9$.

   _____

3. Simplify the expression
   $(4 \div 2) \times 4 + (2^2 + 4)$.

   _____

4. Simplify the expression
   $58 + (13 \times 5 - 42) \times 3^2$.

   _____

5. Write an expression with four
   operations and parentheses that
   simplifies to 24.

   _____

   _____

6. The expression $103 \times 82 = 82 \times 103$ is
   an example of which property?

   _____

   _____

7. $22 \times (5 + 8) = (22 \times 5) + (22 \times 8)$ is an
   example of which property?

   _____

   _____

8. $1,776 \times 1 = 1,776$ is an example of
   which property?

   _____

   _____

9. $14 \times 7 + 14 \times 5 = 14(7 + 5)$ is an
   example of which property?

   _____

   _____

10. $\dfrac{p}{2} + \dfrac{q}{2} = \dfrac{q}{2} + \dfrac{p}{2}$ is an example of which
    property?

    _____

    _____

11. Evaluate $9r^2 \div r$ for $r = 3$.

    _____

12. Evaluate $54t - 3z + 6$ for $t = 3$ and
    $z = 8$.

    _____

13. Evaluate $75 + 5p^2 - 9c$ for $p = 7$
    and $c = 12$.

    _____

14. Evaluate $4x^2 - 5xy + 21y^2$ for $x = 5$
    and $y = 2$.

    _____

15. Evaluate $8a^2 \div 3ab$ for $a = 4$ and
    $b = 6$.

    _____

16. Write an expression equal to "eleven
    less than a number divided by
    fourteen".

    _____

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CHAPTER	**Algebraic Reasoning**
1	**Free Response Test C, continued**

17. How would you write a phrase that represents the expression $24x + 19$?

_____

_____

18. Write an expression equal to "8 less than the product of 33 and a number"?

_____

19. How would you write a phrase that represents the expression $21(x - 7)$?

_____

_____

20. Simplify $37a^2 + 2b - 7a^2$.

_____

21. Simplify $14m^3 + 8n + 15 - 5m^3 + 3n$.

_____

22. Simplify the expression $8x + 5x^2 - 3x + 2x^2$.

_____

23. The side length of a regular pentagon is $8x - 25$. Write an expression for the perimeter of the pentagon.

_____

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