Grade 8 Math - Final Exam Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

Students Who Eat School Lunches
These 4 graphs display the same data.

Graph A

Graph B

Graph C

Graph D

___ 1. Use the 4 School Lunch graphs above.
   Which type of graph is most appropriate for finding the total number of girls who eat school lunches?
   a. Graph A     b. Graph B     c. Graph C     d. Graph D

___ 2. Use the 4 School Lunch graphs above.
   Which type of graph is most appropriate for finding the number of Grade 9 students who eat school lunches?
   a. Graph A     b. Graph B     c. Graph C     d. Graph D

___ 3. Use the 4 School Lunch graphs above.
   Which type of graph is most appropriate for finding the percent of Grades 8 and 9 students who eat school lunches?
   a. Graph A     b. Graph B     c. Graph C     d. Graph D

___ 4. Use the 4 School Lunch graphs above.
   Which type of graph is most appropriate for finding the total number of students who eat school lunches?
   a. Graph A     b. Graph B     c. Graph C     d. Graph D
5. These graphs show Enid’s scores on 3 tests. In which graph are the data misrepresented?

a. Graph A  b. Graph B  c. Graph C  d. Graph D

6. Using a factor tree, find the square root of 324.

7. Find the approximate side length of a square with area 242 cm².

8. Which has the longer diagonal, the rectangle or the square?

9. Determine whether a triangle with each set of side lengths is a right triangle.
   a) 9 cm, 12 cm, 15 cm  
   b) 24 cm, 10 cm, 26 cm  
   c) 22 cm, 21 cm, 30 cm  
   d) 21 cm, 20 cm, 29 cm

10. Which products are negative?
    a) \((-4) \times (-25)\)
    b) \((-7) \times (-16)\)
    c) \((-4) \times (-23)\)
    d) \((-4) \times (-7)\)

11. Evaluate. \((+22) + (-6) \times (-5)\)

12. Evaluate. \(6(12 - 6) - 20\)

13. Evaluate. \(11 - 7 \times 9 - 7\)

14. Evaluate. \(\frac{7\times(9) - (-1)}{8}\)

15. Evaluate. \(\frac{9(-6) - 2(-3)}{2(-5)}\)
16. Multiply. $\frac{10}{5} \times \frac{5}{6}$

17. Multiply. $\frac{1}{6} \times \frac{3}{4}$

18. One-half of the Grade 8 students play on a soccer team. Of those who play on a soccer team, one-quarter are girls. What fraction of the Grade 8 students are the girls who play soccer?

19. Multiply. $\frac{4}{5} \times \frac{7}{8}$

20. Find this quotient. $\frac{13}{15} \div \frac{2}{3}$

21. A rope is $\frac{19}{24}$ m long. How many $\frac{1}{6}$ m pieces can be cut from this rope?

22. Evaluate. $\frac{5}{4} \times \frac{2}{3} - \frac{1}{6} - \frac{2}{3}$

23. Evaluate. $\frac{3}{4} - \frac{1}{3} \times \frac{1}{2}$

24. The net for a juice container is shown. Describe the shape and dimensions of the container.

25. This is the net of a right rectangular prism with square bases. What is the surface area of the prism?

26. Find the surface area of this right rectangular prism.

27. Find the surface area of this right triangular prism.

28. Find the volume of this square prism.
29. Calculate the volume of this triangular prism.

![Triangular Prism Diagram]

30. A cylindrical tank has diameter 3.2 m and length 12.7 m.
What is the surface area of the tank, to 1 decimal place?

31. The area of the base of a cylinder is 183 cm$^2$. The height of the cylinder is 14 cm.
Calculate the volume of the cylinder.

32. The diameter of a cylinder is 15 m and its height is 5 m.
Calculate the volume of the cylinder to the nearest tenth. Use $\pi \approx 3.14$.

33. Write 15.5% as a fraction in simplest form and as a decimal.

34. Write 2.76 as a fraction and as a percent.

35. If GST is 5%, calculate the GST on a pair of running shoes priced at $71.48.

36. The price of a computer is reduced from $880 to $660. What is the percent decrease in price?

37. On a school trip, there are 11 boys, 13 girls, and 5 adults.
What is the ratio of boys to girls? Students to adults?

38. In a basketball game, Steve made 17 of 20 foul shots and Ahmed made 13 of 15 foul shots.
Which player had the better score? Explain.

39. A plane travelled 2700 km in 9 h. How far did it travel in 1 h?

40. Corrie drove 176 km in 4 h. Geri drove 215 km in 5 h.
Who drove faster? Explain.

41. Solve this equation. $-5x + 4 = 24$

42. Solve this equation. $7 + 4x = -12$

43. Solve this equation: $11 = -4(x + 2)$

44. Make a table of values for the relation $y = x - 4$ for $x = -4, -3, -2, -1, 0$.

45. Graph the relation $y = 4x$ for integer values of $x$ from 0 to 4.

46. A spinner is divided into 4 equal sectors of red, green, blue, and purple.
A regular 6-sided die labelled 1 to 6 is rolled and the pointer of the spinner is spun.
What is the probability of rolling an even number and the pointer landing on red?

47. Pedro, Elaine, and Hessna each has a standard deck of playing cards.
They each picks a card at random from his/her own deck.
What is the probability of Pedro picking a club, Elaine picking a red card, and Hessna picking an ace?

48. This object is made using linking cubes. Sketch the right side, front, and top views of the object.

![Object Diagram]
49. This object is given a vertical rotation of 90° clockwise about the horizontal axis shown. Draw the top, left side, front, and right side views of the rotated object.

![Diagram of three cubes rotated 90° clockwise.]

50. These are the top, front, and right side views of an object built using linking cubes. Sketch a 3-D picture of the object.

![Top, front, and right side views of a cube built using linking cubes.]

51. Show how this regular octagon and this square combine to form a shape that tessellates. Explain why the composite shape tessellates.

![Regular octagon and square.]

Problem

52. A square gymnasium floor has area 169 m². Find the perimeter of the gymnasium floor.

53. a) List the factors of each number in ascending order.
   i) 24
   ii) 20
   iii) 25
   iv) 50
   b) Which number in part a is a square number? How can you tell?

54. PQRS is a trapezoid with \( \angle P = 90° \). Find the length of RS. Give the length to the nearest millimetre. Show your work.

![Diagram of trapezoid PQRS with dimensions.]

55. Evaluate. Show your steps.
   \((+2)(-3)(-4) + (+5)(-6)\)

56. Evaluate. Show your steps.
   \((-8) \times (+12) + (-4)\)

57. Noreen borrowed $9 every week. She now owes $72. For how many weeks did she borrow money?
   a) Write this problem as a division expression using integers.
   b) Solve the problem. Explain your work.

58. Simplify \( \frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \ldots \frac{24}{25} \). Explain your answer.

59. Jack has 5 dogs and each dog gets \( \frac{1}{4} \) kg of food each day.
   If Jack has \( \frac{3}{4} \) kg of dog food, how long can it last?
   Explain how you solve the problem.
60. Evaluate. Show your steps.
\[
\frac{1}{3} \times \frac{7}{2} = \frac{1}{7}
\]

61. In a sports centre, \(\frac{3}{4}\) of the members are female. If there are 120 female members, what is the total number of members in the sports centre? Explain your work.

62. Sketch and label a net of this right triangular prism.

63. An antique vase was priced $120. After 5 years, the value of the vase has increased by 20%. What is the new price of the vase? Show your work.

64. Two stores sell the same model of a stereo with an original price of $573. Store A offers a 16% discount and Store B sells the stereo for $458.40. Which store gives the bigger percent discount? Justify your answer.

65. A bag contains 234 red cubes and green cubes in the ratio of 6 red to 7 green. How many of each colour are there in the bag? Explain your strategy.

66. Marco drove a distance of 622 km in 12 h to visit his cousin.
   a) What was his average speed for the hours that he drove?
   b) Marco wanted to shorten the driving time by 0.5 h.
      What average speed should he drive to do this? Show your work.

67. Solve this equation. \(\frac{2x}{7} + 5 = 15\)
   Show your work.

68. Expand. \(6(2x + 4)\)
   Show your work.
Grade 8 Math - Final Exam Review
Answer Section

MULTIPLE CHOICE

1. ANS: A   PTS: 1   DIF: Moderate
   REF: 6.3 Solving Equations Involving Fractions   LOC: 8.PR2
   TOP: Patterns and Relations (Variables and Equations)   KEY: Conceptual Understanding

2. ANS: C   PTS: 1   DIF: Moderate
   REF: 7.1 Choosing an Appropriate Graph   LOC: 8.SP1
   TOP: Statistics and Probability (Data Analysis)   KEY: Conceptual Understanding

3. ANS: A   PTS: 1   DIF: Moderate
   REF: 7.1 Choosing an Appropriate Graph   LOC: 8.SP1
   TOP: Statistics and Probability (Data Analysis)   KEY: Conceptual Understanding

4. ANS: B   PTS: 1   DIF: Moderate
   REF: 7.1 Choosing an Appropriate Graph   LOC: 8.SP1
   TOP: Statistics and Probability (Data Analysis)   KEY: Conceptual Understanding

5. ANS: D   PTS: 1   DIF: Moderate
   REF: 7.1 Choosing an Appropriate Graph   LOC: 8.SP1
   TOP: Statistics and Probability (Data Analysis)   KEY: Conceptual Understanding

6. ANS: A   PTS: 1   DIF: Difficult
   REF: 7.2 Misrepresenting Data   LOC: 8.SP1
   TOP: Statistics and Probability (Data Analysis)   KEY: Conceptual Understanding

SHORT ANSWER

7. ANS:
   15.56 cm
   TOP: Number   KEY: Conceptual Understanding

8. ANS:
   Rectangle: 15.62 units
   Square: 15.56 units
   The rectangle has the longer diagonal.
   PTS: 1   DIF: Moderate   REF: 1.5 The Pythagorean Theorem   LOC: 8.N1 | 8.SS1
   TOP: Number | Shape and Space (Measurement)   KEY: Conceptual Understanding

9. ANS:
   a) Right triangle
   b) Right triangle
   c) Not a right triangle
   d) Right triangle
   PTS: 1   DIF: Moderate   REF: 1.6 Exploring the Pythagorean Theorem   LOC: 8.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
10. ANS:
The products in a), c), and d) are negative.

PTS: 1   DIF: Easy   REF: 2.1 Using Models to Multiply Integers
LOC: 8.N7   TOP: Number   KEY: Conceptual Understanding

11. ANS:
+52

PTS: 1   DIF: Moderate   REF: 2.1 Using Models to Multiply Integers
LOC: 8.N7   TOP: Number   KEY: Conceptual Understanding | Procedural Knowledge

12. ANS:
$6(12 - 6) - 20 = 6(6) - 20$
$= 36 - 20$
$= 16$

PTS: 1   DIF: Moderate   REF: 2.5 Order of Operations with Integers
LOC: 8.N7   TOP: Number   KEY: Conceptual Understanding | Procedural Knowledge

13. ANS:
$11 - (7 \times 9) - 7 = 11 - 63 - 7$
$= -59$

PTS: 1   DIF: Moderate   REF: 2.5 Order of Operations with Integers
LOC: 8.N7   TOP: Number   KEY: Conceptual Understanding | Procedural Knowledge

14. ANS:
\[
\frac{(7)(9) - (-1)}{8} = \frac{63 - (-1)}{8}
\]
$= \frac{64}{8}$
$= 8$

PTS: 1   DIF: Moderate   REF: 2.5 Order of Operations with Integers
LOC: 8.N7   TOP: Number   KEY: Conceptual Understanding | Procedural Knowledge

15. ANS:
\[
\frac{9(-8) + 2(-3)}{2(-3)} = \frac{(-72) + (-6)}{-6}
\]
$= \frac{12}{-6}$
$= -2$

PTS: 1   DIF: Moderate   REF: 2.5 Order of Operations with Integers
LOC: 8.N7   TOP: Number   KEY: Conceptual Understanding | Procedural Knowledge

16. ANS:
\[
\frac{25}{3}
\]

PTS: 1   DIF: Moderate
REF: 3.1 Using Models to Multiply Fractions and Whole Numbers
LOC: 8.N6   TOP: Number   KEY: Conceptual Understanding
17. ANS: \( \frac{1}{8} \)
   PTS: 1  DIF: Moderate  REF: 3.2 Using Models to Multiply Fractions
   LOC: 8.N6  TOP: Number  KEY: Conceptual Understanding

18. ANS: One-eighth
   PTS: 1  DIF: Difficult  REF: 3.2 Using Models to Multiply Fractions
   LOC: 8.N6  TOP: Number  KEY: Conceptual Understanding | Problem-solving Skills

19. ANS: 9
   PTS: 1  DIF: Moderate  REF: 3.4 Multiplying Mixed Numbers
   LOC: 8.N6  TOP: Number  KEY: Conceptual Understanding

20. ANS: \( \frac{3}{10} \)
   PTS: 1  DIF: Moderate  REF: 3.6 Dividing Fractions
   LOC: 8.N6  TOP: Number  KEY: Conceptual Understanding

21. ANS: \( \frac{3}{4} \) pieces
   PTS: 1  DIF: Moderate  REF: 3.6 Dividing Fractions
   LOC: 8.N6  TOP: Number  KEY: Conceptual Understanding | Problem-solving Skills

22. ANS: \( \frac{7}{12} \)
   PTS: 1  DIF: Moderate  REF: 3.9 Order of Operations with Fractions
   LOC: 8.N6  TOP: Number  KEY: Procedural Knowledge

23. ANS: \( \frac{3}{4} \)
   PTS: 1  DIF: Difficult  REF: 3.9 Order of Operations with Fractions
   LOC: 8.N6  TOP: Number  KEY: Procedural Knowledge

24. ANS: The juice container is in the shape of a square pyramid.
The square base has side length 12 cm and the height is 9 cm.

   PTS: 1  DIF: Moderate  REF: 4.2 Creating Objects from Nets
   LOC: 8.SS2  TOP: Shape and Space (Measurement)  KEY: Communication

25. ANS: 264 cm\(^2\)
26. **ANS:**
   66 cm$^2$

27. **ANS:**
The surface area of the prism is 173.1 cm$^2$.

28. **ANS:**
The volume is 171 cm$^3$.

29. **ANS:**
The volume of the prism is 216 cm$^3$.

30. **ANS:**
The surface area of the tank is about 143.8 m$^2$.

31. **ANS:**
The volume of the cylinder is 2562 cm$^3$.

32. **ANS:**
The volume of the cylinder is about 883.1 cm$^3$.

33. **ANS:**
$\frac{31}{200} = 0.155$

34. **ANS:**
$\frac{19}{25} = 76\%$
35. **ANS:**
The GST on the running shoes is $3.57.

**PTS:** 1  **DIF:** Easy  **REF:** 5.4 Sales Tax and Discount
**LOC:** 8.N3  **TOP:** Number  **KEY:** Conceptual Understanding

36. **ANS:**
The percent decrease in price is 25%.

**PTS:** 1  **DIF:** Moderate  **REF:** 5.4 Sales Tax and Discount
**LOC:** 8.N3  **TOP:** Number  **KEY:** Conceptual Understanding

37. **ANS:**
The ratio of boys to girls is 11:13.
The ratio of students to adults is 24:5.

**PTS:** 1  **DIF:** Moderate  **REF:** 5.5 Exploring Ratios
**LOC:** 8.N4  **TOP:** Number  **KEY:** Conceptual Understanding

38. **ANS:**
Ahmed has the better score.
17 of 20 is equivalent to 51 of 60.
13 of 15 is equivalent to 52 of 60.

**PTS:** 1  **DIF:** Moderate  **REF:** 5.7 Comparing Ratios
**LOC:** 8.N5  **TOP:** Number  **KEY:** Conceptual Understanding | Communication

39. **ANS:**
The plane travelled 300 km in 1 h.

**PTS:** 1  **DIF:** Easy  **REF:** 5.9 Exploring Rates
**LOC:** 8.N5  **TOP:** Number  **KEY:** Conceptual Understanding

40. **ANS:**
Corrie drove faster.
Corrie drove at 44 km/h while Geri drove at 43 km/h.

**PTS:** 1  **DIF:** Moderate  **REF:** 5.9 Exploring Rates
**LOC:** 8.N5  **TOP:** Number  **KEY:** Conceptual Understanding | Communication

41. **ANS:**
\[ x = -6 \]

**PTS:** 1  **DIF:** Moderate  **REF:** 6.1 Solving Equations Using Models
**LOC:** 8.PR2  **TOP:** Patterns and Relations (Variables and Equations)
**KEY:** Conceptual Understanding

42. **ANS:**
\[ x = -5 \]

**PTS:** 1  **DIF:** Moderate  **REF:** 6.1 Solving Equations Using Models
**LOC:** 8.PR2  **TOP:** Patterns and Relations (Variables and Equations)
**KEY:** Conceptual Understanding

43. **ANS:**
\[ s = -\frac{3}{4} \]
PTS: 1  DIF: Moderate  REF: 6.5 Solving Equations Involving the Distributive Property  
LOC: 8.PR2  TOP: Patterns and Relations (Variables and Equations)  
KEY: Conceptual Understanding

44. ANS:

<table>
<thead>
<tr>
<th>x</th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>-8</td>
<td>-7</td>
<td>-6</td>
<td>-5</td>
<td>-4</td>
</tr>
</tbody>
</table>

PTS: 1  DIF: Moderate  REF: 6.6 Creating a Table of Values  
LOC: 8.PR1  TOP: Patterns and Relations (Variables and Equations)  
KEY: Conceptual Understanding

45. ANS:

\[
\begin{array}{c|c|c|c|c|c}
   \text{x} & 1 & 2 & 3 & 4 & 5 \\
   \text{y} & 4 & 8 & 12 & 16 & \\
\end{array}
\]

PTS: 1  DIF: Easy  REF: 6.7 Graphing Linear Relations  
LOC: 8.PR1  TOP: Patterns and Relations (Variables and Equations)  
KEY: Conceptual Understanding

46. ANS:

\[P(\text{even and red}) = \frac{1}{8}\]

PTS: 1  DIF: Moderate  REF: 7.3 Probability of Independent Events  
LOC: 8.SP2  TOP: Statistics and Probability (Chance and Uncertainty)  
KEY: Conceptual Understanding

47. ANS:

\[P(\text{club, red, and ace}) = \frac{1}{104}\]

PTS: 1  DIF: Moderate  REF: 7.4 Solving Problems Involving Independent Events  
LOC: 8.SP2  TOP: Statistics and Probability (Chance and Uncertainty)  
KEY: Conceptual Understanding

48. ANS:

Right side view  Front view  Top view
49. ANS:

![Top view]

![Left side view]

![Front view]

![Right side view]

PTS: 1     DIF: Easy     REF: 8.1 Sketching Views of Objects
LOC: 8.SS5   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Conceptual Understanding | Communication

50. ANS:

![Front]

![Right]

PTS: 1     DIF: Moderate     REF: 8.2 Drawing Views of Rotated Objects
LOC: 8.SS5   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Conceptual Understanding | Communication

51. ANS:

At each point where the vertices meet, the sum of the angle measures is 360°.

PTS: 1     DIF: Moderate     REF: 8.3 Building Objects from Their Views
LOC: 8.SS5   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Communication | Problem-solving Skills

52. ANS:

Find the side length of the gymnasium floor:

Find a number which, when multiplied by itself, gives 169.
\[ 13 \times 13 = 169 \]
So, the gymnasium floor has side length 13 m.

Perimeter is the distance around the gymnasium floor.
So, \[ P = 13 \text{ m} + 13 \text{ m} + 13 \text{ m} + 13 \text{ m} \]
\[ = 52 \text{ m} \]
The perimeter of the gymnasium floor is 52 m.

\[ \text{ANS:} \]
\[ \text{a)} \]
\[ i) \quad 24: 1, 2, 3, 4, 6, 8, 12, 24 \]
\[ ii) \quad 20: 1, 2, 4, 5, 10, 20 \]
\[ iii) \quad 25: 1, 5, 25 \]
\[ iv) \quad 50: 1, 2, 5, 10, 25, 50 \]

\[ \text{b)} \quad 25 \text{ is a square number because it has an odd number of factors.} \]

\[ \text{ANS:} \]
Methods may vary. Sample:
Draw \( \triangle RST \) so that \( \angle RTS = 90^\circ \).

\[ \text{RT} = 4 \text{ cm} \]
\[ \text{ST} = \text{PS} - \text{PT} \]
\[ = 9 \text{ cm} - 5 \text{ cm} \]
\[ = 4 \text{ cm} \]
\( \triangle RST \) is a right triangle.
\[ \text{RS}^2 = \text{RT}^2 + \text{ST}^2 \]
\[ = 4^2 + 4^2 \]
\[ = 32 \]
\[ \text{RS} = \sqrt{32} \]
\[ \approx 5.7 \]
The length of RS is about 5.7 cm.

\[ \text{ANS:} \]
\[ (+2)(-3)(-4) = +24 \]
\[ (+5)(-6) = -30 \]
\[ (+24) + (-30) = -6 \]
56. ANS:
\((-8) \times (+12) = -96\\
(-96) \div (-4) = +24\\

PTS: 1  DIF: Difficult  REF: 2.2 Developing Rules to Multiply Integers
LOC: 8.N7  TOP: Number  KEY: Procedural Knowledge | Communication

57. ANS:
a) \(-9\) represents $9 borrowed every week.
   \(-72\) represents a total of $72 borrowed.
   To find the number of weeks, divide: \((-72) \div (-9)\\
b) \(-72) \div (-9) = +8\\
   So, Noreen borrowed money for 8 weeks.

PTS: 1  DIF: Moderate  REF: 2.3 Using Models to Divide Integers
LOC: 8.N7  TOP: Number  KEY: Procedural Knowledge | Communication

58. ANS:
\[\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \cdots \frac{24}{25} = \frac{1}{25}\]
Explanations may vary. Sample:
\[\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \cdots \frac{24}{25} = \frac{1 \times 2 \times 3 \times 4 \times \cdots \times 24}{2 \times 3 \times 4 \times \cdots \times 25}\]
Divide the numerator and denominator by \(2 \times 3 \times 4 \times \cdots \times 24\) will give the result \(\frac{1}{25}\).

PTS: 1  DIF: Difficult  REF: 3.3 Multiplying Fractions
LOC: 8.N6  TOP: Number  KEY: Communication | Problem-solving Skills

59. ANS:
Methods may vary. Sample:
To find how much food Jack needs for his 5 dogs, multiply.
\[5 \times \frac{1}{4} = \frac{1}{4}\]
Jack needs \(1 \frac{1}{4}\) kg of dog food each day.

To find the number of the days the dog food can last, divide.
\[8 \frac{3}{4} \div 1 \frac{1}{4} = \frac{35}{4} \div \frac{5}{4} = 7\]
The dog food can last 7 days.

PTS: 1  DIF: Difficult  REF: 3.5 Dividing Whole Numbers and Fractions
LOC: 8.N6  TOP: Number  KEY: Communication | Problem-solving Skills

60. ANS:
\[\frac{1 \frac{1}{3}}{2} \div \frac{1 \frac{1}{7}}{7}\\
\]
\[
\frac{4}{3} \times \frac{15}{2} \div \frac{8}{7} = \frac{4}{3} \times \frac{15}{2} \times \frac{7}{8} = \frac{35}{4} = 8 \frac{3}{4}
\]

PTS: 1  DIF: Difficult  REF: 3.7 Dividing Mixed Numbers  
LOC: 8.N6  TOP: Number  KEY: Procedural Knowledge | Communication

61. ANS:

Find \( \frac{1}{4} \) of the total: \( \frac{120}{3} = 40 \)

The total number of members is: \( 4 \times 40 = 160 \)
So, there are 160 members in the sports centre.

PTS: 1  DIF: Difficult  REF: 3.8 Solving Problems with Fractions  
LOC: 8.N6  TOP: Number  KEY: Communication | Problem-solving Skills

62. ANS:

Diagrams may vary. Sample:

```
5
\(\bigtriangleup\)
5
6
10
5
5
5
7
```

PTS: 1  DIF: Moderate  REF: 4.1 Exploring Nets  
LOC: 8.SS2  TOP: Shape and Space (Measurement)  
KEY: Conceptual Understanding | Communication

63. ANS:

Methods may vary. Sample:

\[100\% + 20\% = 120\%\]

The new price is 120\% of the original price.

\[
\text{New price} = \$120 \times 120\% = \$120 \times \frac{120}{100} = \$144
\]

The new price of the vase is $144.
64. **ANS:**
Explanations may vary. Sample:
$\frac{\$458.40}{\$573} = 0.8$, or 80%

$\$458.40$ is 80% of $\$573$. That is, Store B offers a discount of 20%.
Since 20% is more than 15%, Store B gives the bigger percent discount.

65. **ANS:**
Methods may vary. Sample:
The ratio of red cubes to green cubes is 6:7.
So, the ratio of red cubes to total number of cubes (red plus green) is 6:13.
For every 13 cubes, 6 are red and 7 are green.
Since $234 = 13 \times 18$, multiply each of 6 and 7 by 18.

\[6 \times 18 = 108 \]
\[7 \times 18 = 126\]
There are 108 red cubes and 126 green cubes in the bag.

66. **ANS:**
a) \[\frac{622 \text{ km}}{12 \text{ h}} = 51.8 \text{ km/h}\]
Marco’s average speed was about 51.8 km/h.
b) Methods may vary. Sample:
The new driving time is 11.5 h.

\[\frac{622 \text{ km}}{11.5 \text{ h}} = 54.1 \text{ km/h}\]
Marco should drive at an average speed of about 54.1 km/h to reduce his driving time by 0.5 h.

67. **ANS:**
\[\frac{2x}{7} + 5 - 5 = 15 - 5\]
\[\frac{2x}{7} = 10\]
\[\frac{2x}{7} \times 7 = 10 \times 7\]
\[2x = 70\]
\[\frac{2x}{2} = \frac{70}{2}\]
\[x = 35\]
68. **ANS:**

\[ 6(2x + 4) = 6(2x) + 6(4) \]
\[ = 12x + 24 \]

**PTS:** 1  
**DIF:** Moderate  
**REF:** 6.4 The Distributive Property  
**LOC:** 8.PR2  
**TOP:** Patterns and Relations (Variables and Equations)  
**KEY:** Conceptual Understanding | Communication