PRACTICE EXAM 22: EQAO GRADE 6 MATHEMATICS SIMULATION (44 QUESTIONS)

STAGE 1 (Questions 1-11) — 30 minutes

1. (Number Sense) What is the value of the digit 8 in the number 84,592,176?

A) 80,000,000

B) 8,000,000

C) 800,000

D) 8,000

2. (Algebra) A pattern follows the rule "add 7 to the previous term, then divide by 2." If the first term is 5, what is the third term?

A) 12

B) 5

C) 6.5

D) 7.5

3. (Spatial Sense) How many vertices does a triangular prism have?

A) 5

B) 6

C) 8

D) 9

4. (Number Sense) Calculate: 9.6 ÷ 0.4

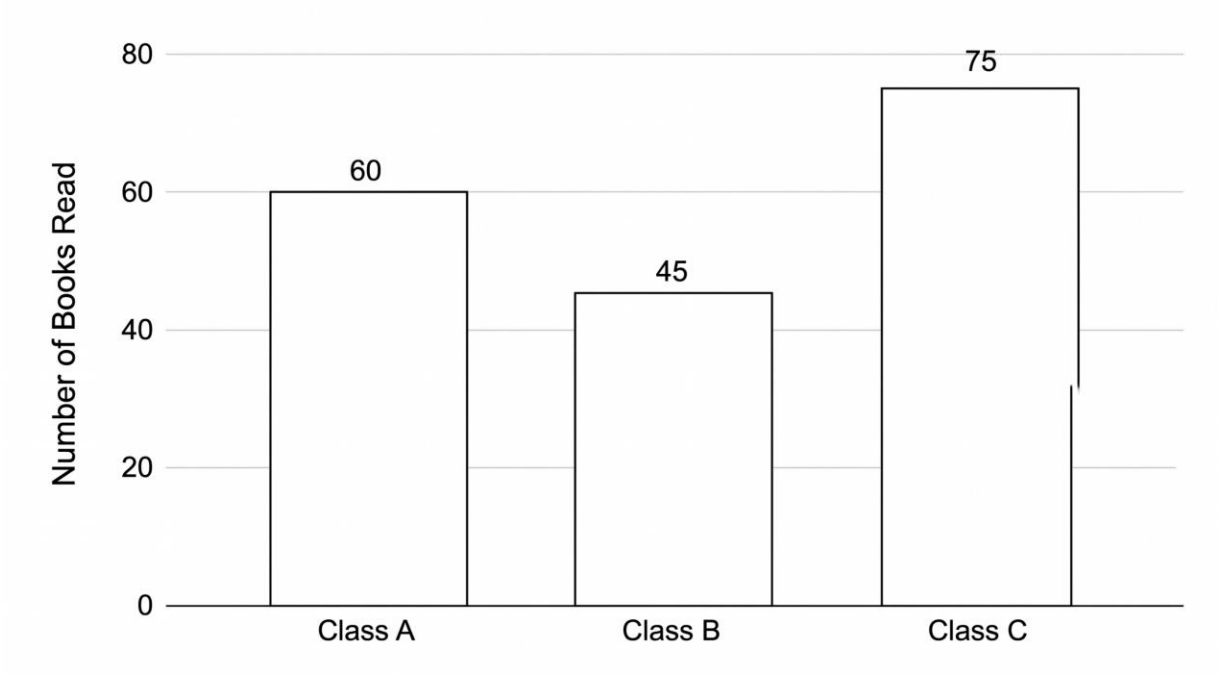
A) 2.4

B) 0.24

C) 3.84

D) 24

5. (Data Literacy) The bar graph shows the number of books read by students in three classes.



By how many books does Class C exceed Class B?

A) 30

B) 15

C) 45

D) 120

6. (Number Sense) What is the sum: 2 1/3 + 3 5/6?

A) 5 6/9

B) 5 1/2

C) 6 5/6

D) 6 1/6

7. (Financial Literacy) Lucas earned $45 from his first job and $32 from his second job. He spent 40% of his total earnings. How much does he have left?

A) $30.80

B) $44.20

C) $46.20

D) $50.80

8. (Algebra) If $2(x + 5) = 28$, what is the value of x?

A) 7

B) 9

C) 12

D) 14

9. (Spatial Sense) A cylinder has a radius of 6 cm. What is its diameter?

A) 3 cm

B) 36 cm

C) 6 cm

D) 12 cm

10. (Number Sense) Order these numbers from least to greatest: 0.7, 5/8, 0.55, 3/4

A) 0.55, 5/8, 0.7, 3/4

B) 3/4, 0.7, 5/8, 0.55

C) 5/8, 0.55, 0.7, 3/4

D) 0.55, 0.7, 5/8, 3/4

11. (Algebra) A linear pattern is given by $t = 8n - 12$. What is the value of t when $n = 6$?

A) 30

B) 32

C) 36

D) 42

STAGE 2 (Questions 12-22) — 30 minutes

12. (Number Sense) Calculate: 12 + (-8) - (-5)

A) 7

B) 9

C) -1

D) 15

13. (Spatial Sense) In a triangle, two angles measure 72° and 53°. What is the measure of the third angle?

A) 35°

B) 45°

C) 65°

D) 55°

14. (Data Literacy) In a survey, 60 students chose their favorite color. The data shows 18 chose blue, 15 chose red, 12 chose green, and the rest chose yellow. What is the probability of randomly choosing a student who picked yellow, in simplest form?

A) 15/60

B) 3/10

C) 1/4

D) 1/5

15. (Number Sense) What is the prime factorization of 90?

A) $2 \times 3^2 \times 5$

B) $2 \times 5 \times 9$

C) $2^2 \times 3 \times 5$

D) 3×30

16. (Algebra) Evaluate the expression $4x^2 - 2x + 7$ when $x = 3$.

A) 35

B) 37

C) 41

D) 43

17. (Financial Literacy) A jacket originally costs $80. It is on sale for 25% off. With an additional 10% off the sale price, what is the final price?

A) $48

B) $52

C) $54

D) $60

18. (Number Sense) A car uses 24 liters of fuel to travel 360 km. How many liters will it use to travel 540 km at the same rate?

A) 36 L

B) 24 L

C) 30 L

D) 40 L

19. (Spatial Sense) A square has a diagonal that divides it into two right triangles. If each side of the square is 6 cm, what is the area of one of the right triangles?

A) 36 cm^2

B) 12 cm^2

C) 9 cm^2

D) 18 cm^2

20. (Data Literacy) Five values are recorded: 14, 28, 21, 35, 17. What is the median?

A) 17

B) 21

C) 28

D) 23

21. (Algebra) A movie ticket costs $12 and a popcorn costs $5. Which expression represents the total cost for t tickets and p popcorns?

A) 12t + 5p

B) 5t + 12p

C) 17(t + p)

D) 60tp

22. (Number Sense) Which number is exactly 10,000 less than 5,283,791?

A) 5,183,791

B) 5,182,791

C) 5,273,791

D) 5,283,691

STAGE 3 (Questions 23-33) — 30 minutes

23. (Spatial Sense) Point P is at coordinates (2, 3). P is reflected across the y-axis, then translated 4 units down. What are the final coordinates?

A) (2, -1)

B) (-2, 3)

C) (2, 7)

D) (-2, -1)

24. (Number Sense) Calculate: $(5 + 3)^2 - 4 \times 6 \div 2$

A) 28

B) 52

C) 44

D) 64

25. (Algebra) Solve for w: 5w + 8 = 3w + 22

A) 4

B) 6

C) 7

D) 8

26. (Data Literacy) A class survey shows that 24 students like pizza, 18 like burgers, and the rest like sushi. If there are 50 students total, what percentage like sushi?

A) 16%

B) 18%

C) 24%

D) 32%

27. (Number Sense) Round 7,649,328 to the nearest hundred thousand.

A) 7,500,000

B) 7,600,000

C) 7,650,000

D) 7,700,000

28. (Financial Literacy) Sara invests $500 at 5% simple interest per year. After how many years will she earn exactly $100 in interest?

A) 2 years

B) 3 years

C) 5 years

D) 4 years

29. (Spatial Sense) A rectangle has an area of 96 cm^2 and a width of 8 cm. What is its perimeter?

A) 24 cm

B) 32 cm

C) 40 cm

D) 48 cm

30. (Algebra) In an arithmetic sequence with first term 8 and common difference 5, what is the 7th term?

A) 38

B) 35

C) 43

D) 33

31. (Number Sense) Evaluate: $2 \times 3^3 - 4^2$

A) 8

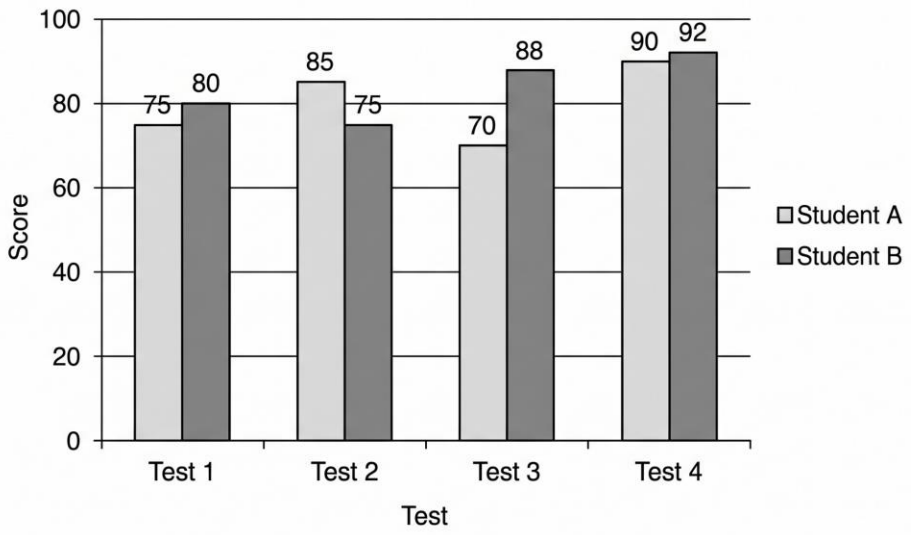
B) 14

C) 24

D) 38

32. (Data Literacy) The double bar graph shows test scores for two students over four tests.

Figure PQ-2



What was Student A's mean score across all four tests?

A) 82

B) 80

C) 78

D) 85

33. (Spatial Sense) A regular polygon has interior angles of 120° each. How many sides does it have?

A) 6

B) 8

C) 10

D) 5

STAGE 4 (Questions 34-44) — 30 minutes

34. (Number Sense) Which improper fraction is equivalent to the mixed number 4 2/5?

A) 8/5

B) 8/10

C) 22/5

D) 24/5

35. (Algebra) A rectangle has length 3x and width x + 4. Which expression represents the perimeter?

A) 4x + 4

B) 4x + 8

C) 6x + 8

D) 8x + 8

36. (Data Literacy) A pizza shop sold 60 pizzas. One-fourth were pepperoni, one-third were cheese, one-fifth were veggie, and the rest were other types. How many were other types?

A) 10

B) 13

C) 15

D) 18

37. (Data Literacy) In a school survey, 5 out of every 8 students said they own a bike. If there are 240 students in the school, how many own a bike?

A) 150

B) 120

C) 96

D) 180

38. (Financial Literacy) A laptop costs $640. Each year, its value decreases by 25% of its current value. What is its value after 1 year?

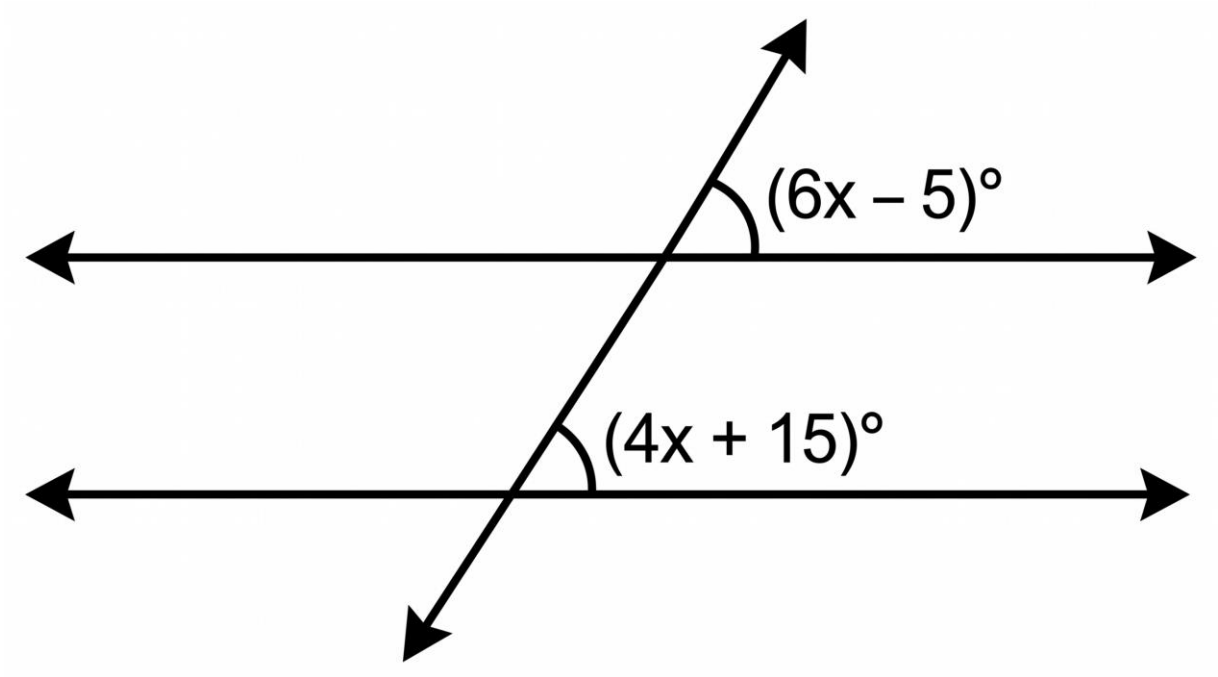
A) $160

B) $400

C) $480

D) $500

39. (Spatial Sense) The diagram shows two parallel lines cut by a transversal, with corresponding angles labeled.



What is the value of x?

A) 5

B) 15

C) 20

D) 10

40. (Algebra) A music streaming service charges a $5 monthly fee plus $0.50 per song downloaded. If Tom paid $12.50 last month, how many songs did he download?

A) 15

B) 12

C) 20

D) 25

41. (Number Sense) Mark has 3/4 of a chocolate bar. He gives 2/3 of what he has to a friend. What fraction of the original chocolate bar does Mark have left?

A) 1/2

B) 1/4

C) 2/3

D) 3/12

42. (Data Literacy) A spinner has 8 equal sections numbered 1 through 8. What is the probability of spinning an even number greater than 3?

A) 1/2

B) 5/8

C) 3/8

D) 1/4

43. (Spatial Sense) A cone has a circular base with a radius of 4 cm. What is the area of the base? (Use $\pi \approx 3.14$)

A) 12.56 cm^2

B) 25.12 cm^2

C) 100.48 cm^2

D) 50.24 cm^2

44. (Number Sense) A recipe calls for 4 cups of flour to make 24 cookies. How much flour is needed to make 36 cookies?

A) 5 cups

B) 6 cups

C) 8 cups

D) 9 cups

Practice Exam 22: Answer Key and Explanations

1. D — The digit 4 occupies the ten-thousands place in 26,847,591. Reading positions from right to left (ones, tens, hundreds, thousands, ten-thousands), the digit 4 sits in the fifth position with a value of 4 × 10,000 = 40,000. Place value identification is fundamental for reading and comparing large numbers.

2. A — Starting at 80 and applying "divide by 2, then add 4": term 1 = 80, term 2 = (80 ÷ 2) + 4 = 44, term 3 = (44 ÷ 2) + 4 = 26. Compound rules require performing both operations in sequence for each new term, with each result becoming the input for the next iteration.

3. B — A hexagonal prism has 18 edges total: 6 edges on the top hexagonal face, 6 edges on the bottom hexagonal face, and 6 vertical edges connecting corresponding vertices. Euler's formula confirms: V - E + F = 12 - 18 + 8 = 2 ✓.

4. C — Multiply 0.85 × 12: think of 85 × 12 = 1,020, then place the decimal two positions from the right since 0.85 has two decimal places: 10.20 = 10.2. Verification: 0.85 × 10 = 8.5, plus 0.85 × 2 = 1.7, totaling 10.2 ✓.

5. B — Sum the bars for intervals above 5 hours: (6-8): 8 students, (9-11): 5 students, (12-14): 3 students. Total: 8 + 5 + 3 = 16 students. Reading histograms requires identifying which intervals satisfy the condition, then summing frequencies.

6. A — Find common denominator (12): 5/6 = 10/12 and 1/4 = 3/12. Subtract: 10/12 - 3/12 = 7/12. Since GCF(7, 12) = 1, the fraction is already in simplest form. Like denominators are required for subtraction.

7. D — Calculate the discount: 30% of \$90 = 0.30 × \$90 = \$27. Sale price: \$90 - \$27 = \$63. Calculate tax: 13% of \$63 = 0.13 × \$63 = \$8.19. Final price: \$63.00 + \$8.19 = \$71.19. Sequential percent operations must be applied in order.

8. C — Solve by moving variables to one side: 3y - 12 = 5y - 22 → 3y - 5y = -22 + 12 → -2y = -10 → y = 5. Check: 3(5) - 12 = 3 and 5(5) - 22 = 3 ✓. Variables on both sides require combining like terms first.

9. A — A nonagon has 9 sides, with the prefix "nona-" meaning nine. A decagon has 10 sides, an octagon has 8 sides, and a heptagon has 7 sides. Recognizing polygon names from their prefixes supports geometric identification.

10. B — Apply order of operations: exponent first: $7^2 = 49$; then multiplication: 4 × 8 = 32; finally add and subtract left to right: 49 + 32 - 15 = 81 - 15 = 66. BEDMAS dictates this sequence for accurate evaluation.

11. D — In an arithmetic sequence, the nth term equals first term plus (n - 1) × common difference. For the 6th term: 12 + (6 - 1)(-3) = 12 + (-15) = -3. Adding a negative common difference produces a decreasing sequence.

12. C — To round 9,278,453 to the nearest thousand, examine the digit immediately to the right (hundreds place): 4. Since 4 < 5, round down. The thousands digit stays at 8, and the digits to the right become zero: 9,278,000.

13. A — In a parallelogram, opposite angles are equal and adjacent angles are supplementary (sum to 180°). If opposite angles measure 65°, the other two angles each measure 180° - 65° = 115°. The four angles together sum to 360° as expected.

14. C — Order the values: 75, 78, 85, 88, 92. With 5 values (odd count), the median is the middle value at position 3, which is 85. Two values fall below and two above this middle point. Median represents the center of ordered data.

15. D — Find prime factorizations: $9 = 3^2$ and $12 = 2^2 \times 3$. LCM takes the highest power of each prime: $2^2 \times 3^2 = 4 \times 9 = 36$. Verification: $36 \div 9 = 4$ and $36 \div 12 = 3$ ✓. LCM is the smallest number both divide into evenly.

16. B — Substitute n = 4 into the formula: -2(4) + 15 = -8 + 15 = 7. Order of operations requires multiplication before addition. Linear formulas like t = -2n + 15 give direct calculations for any term without listing previous values.

17. A — Calculate total savings: \$30 × 5 = \$150. Calculate amount spent: 40% of \$150 = 0.40 × \$150 = \$60. Subtract: \$150 - \$60 = \$90 remaining. Multi-step financial problems require completing each calculation in sequence.

18. C — Dividing by a fraction equals multiplying by its reciprocal: 7 ÷ 2/3 = 7 × 3/2 = 21/2 = 10 1/2. The reciprocal of 2/3 is 3/2 (flip the fraction). Converting improper fractions to mixed numbers shows the result equals 10 with 1/2 left over.

19. B — The ratio 3:4:5 represents 3 + 4 + 5 = 12 total parts. Divide 180° by 12: 180 ÷ 12 = 15° per part. The smallest angle is 3 parts: 3 × 15 = 45°. Ratios proportionally divide a whole based on the given relationship.

20. D — Calculate Math preferences: 60% of 25 = 0.60 × 25 = 15 students. Subtract from total: 25 - 15 = 10 students chose other subjects. Complementary percentages can also be used: 100% - 60% = 40% of 25 = 10 students.

21. C — Find Sarah's current age: 12 - 5 = 7 years old. Mike is twice Sarah's age: 2 × 7 = 14 years old. Multi-step age problems require working through each relationship carefully. The "in 5 years" only affects Sarah's age, not Mike's.

22. A — Apply order of operations: multiplication first: (-4) × 3 = -12. Then subtract: -12 - (-6) = -12 + 6 = -6. Subtracting a negative is equivalent to adding the positive. Sign rules for integer operations require careful tracking of negatives.

23. D — Find the base length: PQ is horizontal from (1, 1) to (5, 1), so PQ = 5 - 1 = 4 units. Height is the vertical distance from R(3, 5) to line PQ: 5 - 1 = 4 units. Area = (1/2)(4)(4) = 8 square units.

24. B — Divide total volume by glass capacity: 2.4 L ÷ 0.3 L = 8 glasses. Multiplying both numbers by 10 simplifies: 24 ÷ 3 = 8. Verification: 0.3 × 8 = 2.4 ✓. Decimal division can be simplified by eliminating decimals.

25. A — The differences double each time: 11-3=8, 27-11=16, 59-27=32. The next difference is 32 × 2 = 64. Apply: 59 + 64 = 123. Identifying patterns in differences (themselves following a pattern) reveals compound growth rules.

26. C — Interquartile range (IQR) equals upper quartile minus lower quartile: 56 - 40 = 16. IQR measures the spread of the middle 50% of data, providing a robust measure of variability that ignores extreme values like the minimum (32) and maximum (70).

27. D — Convert 3/8 to a decimal first: 3 ÷ 8 = 0.375. Convert to percent by multiplying by 100: 0.375 × 100 = 37.5%. Verification: 37.5/100 = 375/1000 = 3/8 ✓. Two-step conversions go through decimal form.

28. B — Use the simple interest formula: I = P × r × t. Solve for t: 90 = 750 × 0.04 × t → 90 = 30t → t = 3 years. Verification: \$750 × 0.04 × 3 = \$90 ✓. Rearranging the formula isolates the unknown variable.

29. A — Use the circumference formula: C = π × d. Solve for d: 18π = π × d → d = 18 cm. The π cancels from both sides. Working backward from circumference to diameter requires recognizing π as a constant factor.

30. C — Subtract the first week's fee: \$48 - \$20 = \$28 for additional weeks. Divide by weekly rate: \$28 ÷ \$7 = 4 additional weeks. Total weeks: 1 (first week) + 4 (additional) = 5 weeks. The "first week" counts as a separate billing unit.

31. B — Calculate the original total: 6 × 25 = 150. Subtract the two removed values: 150 - 18 - 22 = 110. Divide by new count: 110 ÷ 4 = 27.5. When values are removed, both sum and count change, requiring recalculation of the mean.

32. D — Add favorable outcomes: 5 red + 3 yellow = 8 sections. Total sections: 20. Probability: 8/20 = 2/5 in simplest form. Mutually exclusive events (cannot occur together) have their probabilities added together.

33. C — Use the interior angle formula: (n - 2) × 180° / n = 144°. Solve: (n - 2) × 180 = 144n → 180n - 360 = 144n → 36n = 360 → n = 10. A regular decagon has interior angles of 144°. Verification: (10 - 2) × 180 / 10 = 144° ✓.

34. A — Calculate fuel efficiency: 480 km ÷ 32 L = 15 km/L. Multiply by new fuel amount: 15 × 50 = 750 km. Rate problems use distance = rate × quantity. Finding the unit rate first enables flexible calculation for any quantity.

35. B — Simplify each option: A: 5(x+1) + 4 = 5x + 9 (not 4x); B: 4(x+2) + 1 = 4x + 8 + 1 = 4x + 9 ✓; C: 2x + 7 + 2x + 4 = 4x + 11; D: 3x + 6 + x + 4 = 4x + 10. Only option B simplifies to exactly 4x + 9.

36. D — Write the ratio of blue to green: 12:6. Simplify by dividing both terms by their greatest common factor (6): 12:6 = 2:1. Ratios in simplest form use the GCF for reduction, similar to fractions. Verification: $2 \times 6 = 12$ and $1 \times 6 = 6$ ✓.

37. C — Alternate exterior angles formed by parallel lines and a transversal are equal: $3x + 20 = 5x - 30$. Subtract 3x from both sides: $20 = 2x - 30$. Add 30: $50 = 2x$. Divide by 2: $x = 25$. Check: $3(25) + 20 = 95$ and $5(25) - 30 = 95$ ✓.

38. A — Calculate 4/5 of 60: $(4/5) \times 60 = (4 \times 60)/5 = 240/5 = 48$. Alternatively, find 1/5 of 60 (which is 12), then multiply by 4: $12 \times 4 = 48$. Finding fractional parts connects fractions to multiplication and division.

39. D — Calculate 25% of \$24: $0.25 \times \$24 = \$6$. Alternatively, recognizing 25% as 1/4, divide: $\$24 \div 4 = \$6$. The discount amount represents the price reduction, not the final sale price. This distinction supports informed consumer decisions.

40. B — Let w = width and L = 2w (length is twice the width). Perimeter: $2L + 2w = 48 \rightarrow 2(2w) + 2w = 48 \rightarrow 4w + 2w = 48 \rightarrow 6w = 48 \rightarrow w = 8$ cm. Check: L = 16, perimeter = 32 + 16 = 48 ✓.

41. A — Convert 5/8 to a decimal: $5 \div 8 = 0.625$. Convert to percent by multiplying by 100: $0.625 \times 100 = 62.5\%$. Verification: $62.5/100 = 625/1000 = 5/8$ ✓. Common fraction-to-percent conversions appear frequently in real-world calculations.

42. C — Set up a proportion: $5/3 = 40/x$. Cross-multiply: $5x = 120$. Divide by 5: $x = 24$. Verification: 40 + 24 = 64 students total, with $40/64 = 5/8$ dogs and $24/64 = 3/8$ cats, matching the 5:3 ratio. ✓

43. D — Find the edge length: $V = s^3 = 64 \rightarrow s = \sqrt[3]{64} = 4$ cm. Calculate surface area: $SA = 6s^2 = 6(4^2) = 6 \times 16 = 96$ cm². A cube has 6 identical square faces, so multiplying one face's area by 6 gives total surface area.

44. B — Convert mixed number: $1\ 3/4 = 7/4$. Multiply fractions: $(7/4) \times (2/3) = (7 \times 2)/(4 \times 3) = 14/12 = 7/6$ in simplest form. Convert to mixed number: $7/6 = 1\ 1/6$. When multiplying mixed numbers, convert to improper fractions first.