

# PRACTICE EXAM 17: EQAO GRADE 6 MATHEMATICS SIMULATION (44 QUESTIONS)

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## STAGE 1 (Questions 1-11) — 30 minutes

1. (Number Sense) In the number 23,847,196, which digit is in the ten-thousands place?  
A) 4  
B) 8  
C) 7  
D) 1
2. (Algebra) A pattern follows the rule "triple and add 2." If the first term is 4, what is the third term?  
A) 12  
B) 16  
C) 42  
D) 44
3. (Spatial Sense) A regular dodecagon has each side measuring 5 cm. What is its perimeter?  
A) 50 cm  
B) 55 cm  
C) 60 cm  
D) 65 cm
4. (Number Sense) Calculate:  $12.85 + 7.6 - 4.45$   
A) 15.00

- B) 16.00
- C) 16.45
- D) 15.40

5. (Data Literacy) The line graph shows monthly visitors to a museum.

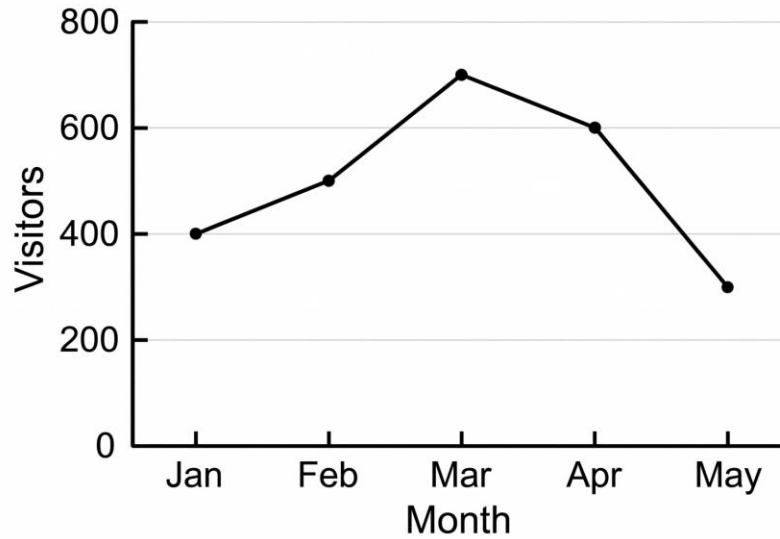


Figure PQ-1

What was the average number of visitors per month over the five months?

- A) 600
- B) 700
- C) 400
- D) 500

6. (Number Sense) Which fraction, when added to  $\frac{2}{3}$ , gives a sum of  $\frac{7}{6}$ ?

- A)  $\frac{1}{2}$
- B)  $\frac{5}{6}$
- C)  $\frac{1}{3}$
- D)  $\frac{1}{6}$

7. (Financial Literacy) A jacket costs \$60. The store offers 15% off, plus a \$5 coupon applied after the discount. What is the final price?

- A) \$40
- B) \$42
- C) \$46
- D) \$55

8. (Algebra) Solve for  $x$ :  $3x + 8 = 2x + 20$

- A) 10
- B) 12
- C) 14
- D) 28

9. (Spatial Sense) A right triangle has legs measuring 3 cm and 4 cm. What is its area?

- A)  $12 \text{ cm}^2$
- B)  $7 \text{ cm}^2$
- C)  $6 \text{ cm}^2$
- D)  $14 \text{ cm}^2$

10. (Number Sense) A bag holds 4.5 kg of rice. How many bags are needed to hold 36 kg of rice?

- A) 4
- B) 6
- C) 9
- D) 8

11. (Algebra) Sara is 3 years older than twice Tom's age. If Sara is 19 years old, how old is Tom?

- A) 8
- B) 11
- C) 22

D) 16

**STAGE 2 (Questions 12-22) — 30 minutes**

12. (Number Sense) Calculate:  $(24 + 16) \times 5 \div 4$

A) 30

B) 50

C) 35

D) 45

13. (Spatial Sense) A square has a perimeter of 32 cm. What is its area?

A)  $32 \text{ cm}^2$

B)  $16 \text{ cm}^2$

C)  $128 \text{ cm}^2$

D)  $64 \text{ cm}^2$

14. (Data Literacy) A bag of marbles contains 8 red, 12 blue, and 5 green marbles. If one marble is drawn at random, what is the probability it is NOT blue, in simplest form?

A)  $12/25$

B)  $8/25$

C)  $13/25$

D)  $5/25$

15. (Number Sense) What is the least common multiple (LCM) of 6 and 8?

A) 24

B) 14

C) 48

D) 2

16. (Algebra) Evaluate the expression  $2x^2 + 3x - 5$  when  $x = 4$ .

- A) 27
- B) 39
- C) 35
- D) 45

17. (Financial Literacy) Daniel earns \$12 per hour. After working a 5-hour shift, he spends 25% of his earnings on lunch. How much money does he have left?

- A) \$30
- B) \$40
- C) \$45
- D) \$50

18. (Number Sense) What is 60% of 85?

- A) 25
- B) 34
- C) 42.5
- D) 51

19. (Spatial Sense) A rectangular swimming pool is 12 m long, 8 m wide, and 2 m deep. What is its volume?

- A)  $192 \text{ m}^3$
- B)  $96 \text{ m}^3$
- C)  $22 \text{ m}^3$
- D)  $80 \text{ m}^3$

20. (Data Literacy) The mean of five numbers is 18. The sum of the first four numbers is 65. What is the fifth number?

- A) 17

- B) 20
- C) 25
- D) 18

21. (Algebra) What is the next term in this sequence: 1, 4, 10, 22, 46, \_\_\_?

- A) 80
- B) 94
- C) 88
- D) 92

22. (Data Literacy) The mean of seven test scores is 85. If one score of 70 is removed, what is the new mean of the remaining six scores?

- A) 80
- B) 85
- C) 90
- D) 87.5

**STAGE 3 (Questions 23-33) — 30 minutes**

23. (Spatial Sense) How many cubes with edge length 2 cm can fit inside a rectangular prism that is 10 cm long, 6 cm wide, and 4 cm tall?

- A) 30
- B) 24
- C) 60
- D) 20

24. (Number Sense) Anna ran  $3\frac{1}{4}$  km on Monday and  $4\frac{1}{2}$  km on Tuesday. How far did she run in total?

- A)  $7\frac{1}{4}$  km

- B)  $7\frac{1}{2}$  km
- C)  $7\frac{3}{4}$  km
- D) 8 km

25. (Algebra) A rectangle has a length of  $(3x + 4)$  and a width of  $(x + 2)$ . Which expression represents the perimeter?

- A)  $4x + 6$
- B)  $6x + 8$
- C)  $8x + 6$
- D)  $8x + 12$

26. (Data Literacy) A scatter plot shows the relationship between hours studied and test scores for 10 students. Most points cluster from the lower-left to upper-right of the graph. What does this relationship suggest?

- A) No relationship between studying and scores
- B) Studying more tends to result in higher scores
- C) Studying less tends to result in higher scores
- D) Test scores cannot be predicted

27. (Number Sense) If 5 notebooks cost \$12.50, how much do 8 notebooks cost at the same unit price?

- A) \$20.00
- B) \$18.00
- C) \$22.50
- D) \$25.00

28. (Financial Literacy) Maya invests \$400 at 5% simple interest per year and \$300 at 4% simple interest per year. How much total interest will she earn after 2 years?

- A) \$30
- B) \$48
- C) \$56

D) \$64

29. (Spatial Sense) In triangle ABC, angle A is  $60^\circ$  and angle B is twice angle C. What is the measure of angle C?

A)  $30^\circ$

B)  $60^\circ$

C)  $40^\circ$

D)  $80^\circ$

30. (Algebra) Solve for n:  $4(n - 3) = 16$

A) 4

B) 7

C) 12

D) 19

31. (Number Sense) A train travels 240 km in 3 hours. At the same rate, how far will it travel in 5 hours?

A) 400 km

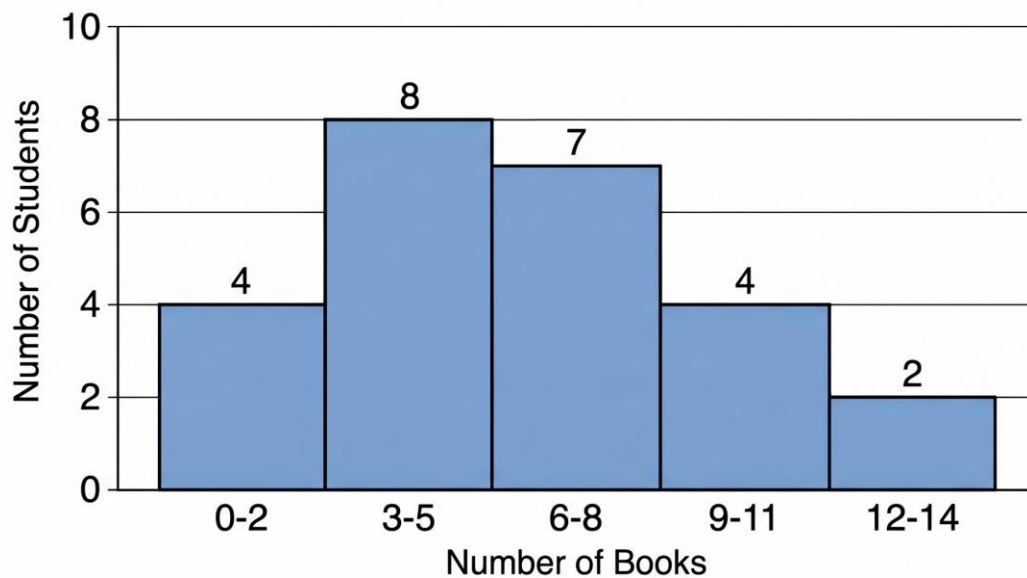
B) 320 km

C) 360 km

D) 480 km

32. (Data Literacy) The histogram shows the number of books read by 25 students last semester.

**Figure PQ-2**



How many students read 6 or more books?

- A) 7
- B) 4
- C) 11
- D) 13

33. (Spatial Sense) The diagram shows two parallel lines cut by a transversal.

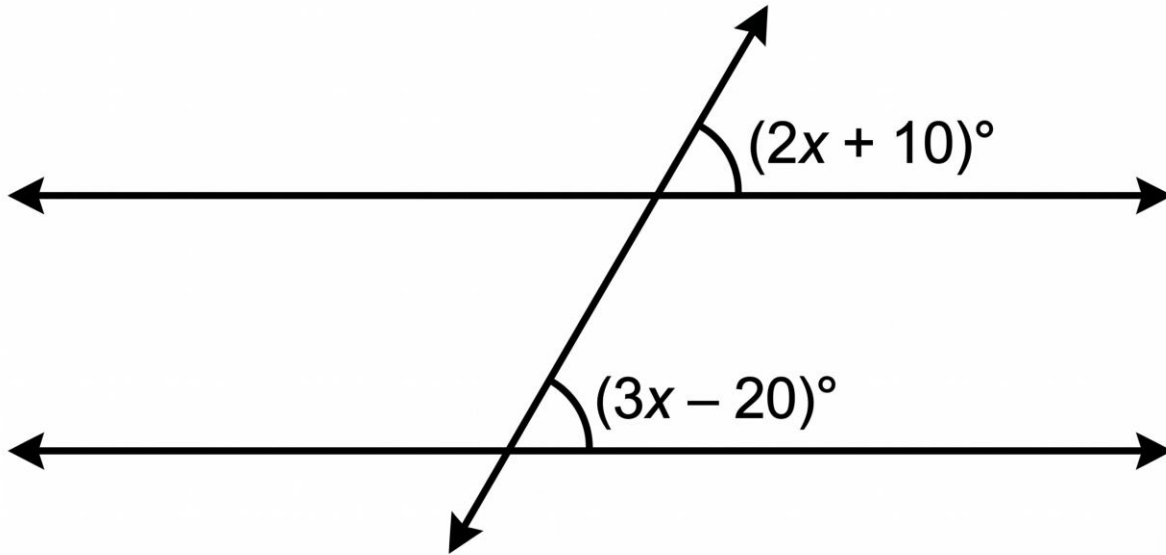


Figure PQ-3

What is the value of  $x$ ?

- A) 10
- B) 20
- C) 30
- D) 40

**STAGE 4 (Questions 34-44) — 30 minutes**

34. (Number Sense) Order these numbers from greatest to least:  $\frac{5}{8}$ , 0.7,  $\frac{3}{5}$

- A) 0.7,  $\frac{5}{8}$ ,  $\frac{3}{5}$
- B)  $\frac{5}{8}$ , 0.7,  $\frac{3}{5}$
- C)  $\frac{3}{5}$ ,  $\frac{5}{8}$ , 0.7
- D) 0.7,  $\frac{3}{5}$ ,  $\frac{5}{8}$

35. (Algebra) Marco is  $x$  years old. In 5 years, his age will be twice his current age minus 3. Which equation models this situation?

- A)  $x + 5 = 2x + 3$
- B)  $x + 5 = 2x - 3$

C)  $x - 5 = 2x + 3$

D)  $x + 5 = x/2 - 3$

36. (Data Literacy) A pizza shop sold 80 pizzas last week. 20% were pepperoni, 35% were cheese, 25% were vegetable, and the rest were other. How many pizzas were "other"?

A) 8

B) 12

C) 16

D) 20

37. (Spatial Sense) A cube has a total surface area of  $150 \text{ cm}^2$ . What is the length of one edge?

A) 25 cm

B) 6 cm

C) 10 cm

D) 5 cm

38. (Number Sense) What is the value of  $(3/4)^2 + 1/4$ ?

A)  $13/16$

B) 1

C)  $9/16$

D)  $7/8$

39. (Financial Literacy) Sophie wants to buy headphones costing \$120. She saves \$15 each week. After 4 weeks, what percentage of the goal has she saved?

A) 25%

B) 50%

C) 60%

D) 75%

40. (Algebra) A movie streaming service charges a monthly fee of \$9.99 plus \$1.50 per movie watched. If Liam pays \$24.99 in one month, how many movies did he watch?

- A) 8
- B) 9
- C) 10
- D) 12

41. (Number Sense) A recipe requires  $\frac{3}{4}$  cup of sugar to make 12 cookies. How much sugar is needed to make 32 cookies?

- A) 1 cup
- B)  $1\frac{1}{2}$  cups
- C)  $1\frac{3}{4}$  cups
- D) 2 cups

42. (Data Literacy) A box-and-whisker plot displays test scores. The minimum is 55, the lower quartile is 65, the median is 75, the upper quartile is 85, and the maximum is 95. What is the interquartile range?

- A) 30
- B) 20
- C) 10
- D) 40

43. (Spatial Sense) Point P is at coordinates  $(-4, 3)$ . When P is rotated  $90^\circ$  clockwise about the origin, what are the new coordinates?

- A)  $(3, 4)$
- B)  $(-3, -4)$
- C)  $(4, -3)$
- D)  $(-4, -3)$

44. (Number Sense) Tom bought items totaling \$28.45 and paid with a \$50 bill. How much change did he receive?

- A) \$21.45
- B) \$21.55
- C) \$22.55
- D) \$22.45

## Practice Exam 17: Answer Key and Explanations

**1. A** — The digit 4 occupies the ten-thousands place in 23,847,196. Reading positions from right to left (ones, tens, hundreds, thousands, ten-thousands), the digit 4 sits in the fifth position with a value of  $4 \times 10,000 = 40,000$ . Place value identification is fundamental for reading and comparing large numbers.

**2. D** — Starting at 4 and applying "triple and add 2" each time: term 1 = 4, term 2 =  $(4 \times 3) + 2 = 14$ , term 3 =  $(14 \times 3) + 2 = 44$ . Compound pattern rules require applying both operations in sequence to each new term. Tracking each step carefully prevents errors in multi-operation patterns.

**3. C** — A regular dodecagon has 12 equal sides (the prefix "dodeca-" means twelve). Perimeter equals the sum of all sides:  $12 \times 5 = 60$  cm. Regular polygons have perimeters calculated by multiplying side length by the number of sides. This shortcut applies to any regular polygon.

**4. B** — Calculate left to right:  $12.85 + 7.60 = 20.45$ , then  $20.45 - 4.45 = 16.00$ . Aligning decimal points ensures proper addition and subtraction. Multi-step calculations require careful tracking of each operation to avoid errors.

**5. D** — Calculate the mean by summing all values and dividing by count:  $(400 + 500 + 700 + 600 + 300) \div 5 = 2,500 \div 5 = 500$ . The average represents the central balancing point of the data, where total visitors distributed equally across all months gives this value.

**6. A** — Subtract  $2/3$  from  $7/6$  to find the missing fraction:  $7/6 - 2/3 = 7/6 - 4/6 = 3/6 = 1/2$  in simplest form. Finding a missing addend requires reversing the addition operation. Like denominators are required for subtraction, so  $2/3$  converts to  $4/6$ .

**7. C** — Calculate the discount first: 15% of \$60 =  $0.15 \times \$60 = \$9$ . Apply discount:  $\$60 - \$9 = \$51$ . Then subtract the \$5 coupon:  $\$51 - \$5 = \$46$ . Sequential discounts must be applied in order, as compound calculations affect the final price.

**8. B** — Solve by combining like terms:  $3x + 8 = 2x + 20 \rightarrow 3x - 2x = 20 - 8 \rightarrow x = 12$ . Subtract  $2x$  from both sides to isolate variables, then subtract 8. Check:  $3(12) + 8 = 44$  and  $2(12) + 20 = 44 \checkmark$ . Variables on both sides require careful manipulation.

**9. C** — Area of a right triangle =  $(1/2) \times \text{leg}_1 \times \text{leg}_2 = (1/2) \times 3 \times 4 = 6 \text{ cm}^2$ . The two perpendicular legs serve as base and height. The right angle's sides are the perpendicular legs, making them the simplest base and height to use.

**10. D** — Divide total weight by bag capacity:  $36 \div 4.5 = 8$  bags. Multiplying  $4.5 \times 8 = 36$  confirms the answer. Division problems with decimals can be checked by reverse multiplication. Real-world division supports practical applications like packaging and storage.

**11. A** — Set up the equation:  $2t + 3 = 19$  (where  $t$  is Tom's age). Subtract 3 from both sides:  $2t = 16$ . Divide by 2:  $t = 8$ . Tom is 8 years old. Check:  $2(8) + 3 = 19 \checkmark$ . Word problems require translating verbal relationships into algebraic equations.

**12. B** — Apply order of operations: brackets first:  $(24 + 16) = 40$ ; then multiplication:  $40 \times 5 = 200$ ; finally division:  $200 \div 4 = 50$ . BEDMAS requires parentheses first, then multiplication and division left to right. Each step must be performed in the correct sequence.

**13. D** — Find side length first:  $32 \div 4 = 8 \text{ cm}$  (since a square has 4 equal sides). Then calculate area:  $8^2 = 64 \text{ cm}^2$ . Two-step problems require completing each part before moving to the next. Connecting perimeter to area requires both formulas.

**14. C** — Total marbles:  $8 + 12 + 5 = 25$ . Non-blue marbles:  $8 + 5 = 13$ . Probability of not blue =  $13/25$  (already in simplest form). Complementary probabilities are easier to calculate as "not the event" rather than computing each individual favorable outcome.

**15. A** — Find the smallest number that both 6 and 8 divide into evenly. Multiples of 6: 6, 12, 18, 24. Multiples of 8: 8, 16, 24. The smallest common value is 24. LCM is essential for adding fractions and solving rate problems with different cycles.

**16. B** — Substitute  $x = 4$ :  $2(4)^2 + 3(4) - 5 = 2(16) + 12 - 5 = 32 + 12 - 5 = 39$ . Order of operations requires evaluating the exponent first, then multiplication, then addition and subtraction. Each operation must be performed in correct order per BEDMAS.

**17. C** — Calculate earnings first:  $\$12 \times 5 = \$60$ . Find lunch cost:  $25\% \text{ of } \$60 = 0.25 \times \$60 = \$15$ . Subtract:  $\$60 - \$15 = \$45$  remaining. Multi-step problems require completing each calculation in sequence before reaching the final answer.

**18. D** — Convert percent to decimal and multiply:  $60\% \times 85 = 0.60 \times 85 = 51$ . Alternatively, find 10% of 85 (which is 8.5), then multiply by 6:  $8.5 \times 6 = 51$ . Finding percent of a number connects to basic multiplication operations.

**19. A** — Volume of a rectangular prism = length  $\times$  width  $\times$  height =  $12 \times 8 \times 2 = 192 \text{ m}^3$ . Volume measures the three-dimensional space occupied by an object, expressed in cubic units. The order of multiplication doesn't affect the result.

- 20. C** — Calculate the total sum from the mean:  $5 \times 18 = 90$ . Subtract the known sum of the first four numbers:  $90 - 65 = 25$ . Working backward from the mean requires understanding that  $\text{mean} \times \text{count} = \text{sum}$ . This inverse calculation finds missing data points.
- 21. B** — The pattern doubles each term and adds 2:  $1 \times 2 + 2 = 4$ ,  $4 \times 2 + 2 = 10$ ,  $10 \times 2 + 2 = 22$ ,  $22 \times 2 + 2 = 46$ ,  $46 \times 2 + 2 = 94$ . Identifying compound rules requires examining multiple operations between consecutive terms.
- 22. D** — Total of seven scores:  $7 \times 85 = 595$ . After removing 70:  $595 - 70 = 525$ . New mean of six scores:  $525 \div 6 = 87.5$ . When data is removed, both the sum and count change, so the mean must be recalculated using the new total.
- 23. A** — Calculate the volume of the prism:  $10 \times 6 \times 4 = 240 \text{ cm}^3$ . Calculate the volume of one small cube:  $2^3 = 8 \text{ cm}^3$ . Divide:  $240 \div 8 = 30$  cubes. Packing problems require comparing total available space to individual unit space.
- 24. C** — Convert to common denominators:  $3 \frac{1}{4} + 4 \frac{1}{2} = 3 \frac{1}{4} + 4 \frac{2}{4} = 7 \frac{3}{4} \text{ km}$ . Adding mixed numbers requires consistent fractional parts. Converting  $\frac{1}{2}$  to  $\frac{2}{4}$  establishes a common denominator before adding numerators.
- 25. D** — Perimeter =  $2(\text{length}) + 2(\text{width}) = 2(3x + 4) + 2(x + 2) = 6x + 8 + 2x + 4 = 8x + 12$ . Distribute the 2 across each pair of parentheses, then combine like terms. This expression represents the perimeter for any value of  $x$ .
- 26. B** — A positive correlation appears as data clustering from lower-left to upper-right, meaning as one variable increases, so does the other. In this case, more study hours correspond to higher test scores. Scatter plots visually display relationships between two variables.
- 27. A** — Find the unit price:  $\$12.50 \div 5 = \$2.50$  per notebook. Calculate cost of 8:  $\$2.50 \times 8 = \$20.00$ . Unit pricing enables scaling to any quantity. This proportional reasoning supports comparison shopping and budgeting decisions.
- 28. D** — Calculate interest for each investment separately. First account:  $400 \times 0.05 \times 2 = \$40$ . Second account:  $300 \times 0.04 \times 2 = \$24$ . Total interest:  $\$40 + \$24 = \$64$ . Multiple investments require calculating each separately, then summing the results.
- 29. C** — Apply the angle sum property:  $A + B + C = 180^\circ$ . With  $A = 60^\circ$  and  $B = 2C$ :  $60 + 2C + C = 180 \rightarrow 3C = 120 \rightarrow C = 40^\circ$ . Setting up algebraic relationships from geometric properties enables solving for unknown angles.
- 30. B** — Distribute and solve:  $4(n - 3) = 16 \rightarrow 4n - 12 = 16 \rightarrow 4n = 28 \rightarrow n = 7$ . Alternatively, divide both sides by 4 first:  $n - 3 = 4$ , then add 3:  $n = 7$ . Check:  $4(7 - 3) = 4(4) = 16 \checkmark$ . Distribution simplifies bracketed expressions.

- 31. A** — Calculate the rate:  $240 \text{ km} \div 3 \text{ hours} = 80 \text{ km/h}$ . Calculate distance for 5 hours:  $80 \times 5 = 400 \text{ km}$ . Constant-rate problems use  $\text{distance} = \text{rate} \times \text{time}$ . Finding the unit rate first enables calculation for any other time period.
- 32. D** — Sum the bars for intervals 6-8, 9-11, and 12-14:  $7 + 4 + 2 = 13$  students. Reading histograms requires identifying which intervals satisfy the condition, then summing their frequencies. The phrase "6 or more" includes the 6-8 interval.
- 33. C** — Corresponding angles formed by parallel lines and a transversal are equal:  $2x + 10 = 3x - 20$ . Solve:  $10 + 20 = 3x - 2x \rightarrow x = 30$ . Check:  $2(30) + 10 = 70$  and  $3(30) - 20 = 70 \checkmark$ . Setting equal angles creates an equation to solve.
- 34. A** — Convert all values to decimals for comparison:  $5/8 = 0.625$ ,  $0.7 = 0.7$ ,  $3/5 = 0.6$ . Order from greatest to least:  $0.7 > 0.625 > 0.6$ , which corresponds to  $0.7, 5/8, 3/5$ . Converting to common form enables accurate comparison.
- 35. B** — Translate the words: "in 5 years" means  $x + 5$ ; "twice his current age" means  $2x$ ; "minus 3" gives  $2x - 3$ . Setting them equal:  $x + 5 = 2x - 3$ . Algebraic translation requires careful identification of each phrase's mathematical meaning.
- 36. C** — Calculate the "other" percentage:  $100\% - 20\% - 35\% - 25\% = 20\%$ . Find 20% of 80 pizzas:  $0.20 \times 80 = 16$  pizzas. Complementary percentages must sum to 100%, allowing calculation of the remaining category before finding its quantity.
- 37. D** — Surface area of cube =  $6s^2$  where  $s$  is the edge length. Solve:  $6s^2 = 150 \rightarrow s^2 = 25 \rightarrow s = 5 \text{ cm}$ . Working backward from surface area requires dividing by 6 (the number of faces), then taking the square root. Verification:  $6(25) = 150 \checkmark$ .
- 38. A** — Apply order of operations:  $(3/4)^2 = 9/16$ . Find common denominator:  $1/4 = 4/16$ . Add:  $9/16 + 4/16 = 13/16$ . Exponents apply to both numerator and denominator of a fraction:  $(3/4)^2 = 3^2/4^2 = 9/16$ .
- 39. B** — Calculate amount saved:  $4 \text{ weeks} \times \$15/\text{week} = \$60$ . Calculate percentage of goal:  $\$60/\$120 = 1/2 = 50\%$ . Percentage calculations require expressing the part-to-whole ratio as a percent. This skill supports tracking progress toward savings goals.
- 40. C** — Subtract the monthly fee from total payment:  $\$24.99 - \$9.99 = \$15.00$  for movies. Divide by cost per movie:  $\$15.00 \div \$1.50 = 10$  movies. Two-step problems separate fixed costs from variable costs before solving.
- 41. D** — Use proportional reasoning:  $3/4$  cup per 12 cookies means  $1/16$  cup per cookie. For 32 cookies:  $32 \times 1/16 = 32/16 = 2$  cups. Alternatively,  $32/12 = 8/3$  times the recipe, so  $3/4 \times 8/3 = 24/12 = 2$  cups. Scaling recipes requires proportional adjustment.
- 42. B** — Interquartile range (IQR) equals the upper quartile minus the lower quartile:  $85 - 65 = 20$ . IQR measures the spread of the middle 50% of data, providing a robust measure of variability less affected by outliers than range.

**43. A** — A  $90^\circ$  clockwise rotation about the origin transforms  $(x, y) \rightarrow (y, -x)$ . Applied to  $(-4, 3)$ : the new x-coordinate is 3 (original y), and the new y-coordinate is  $-(-4) = 4$  (negative of original x). New coordinates:  $(3, 4)$ . Rotation rules preserve distance from origin.

**44. B** — Subtract the total purchase from the bill:  $\$50.00 - \$28.45 = \$21.55$ . Aligning decimal points and borrowing from higher place values ensures accuracy. Change calculations support everyday financial transactions and verifying cash exchanges.