

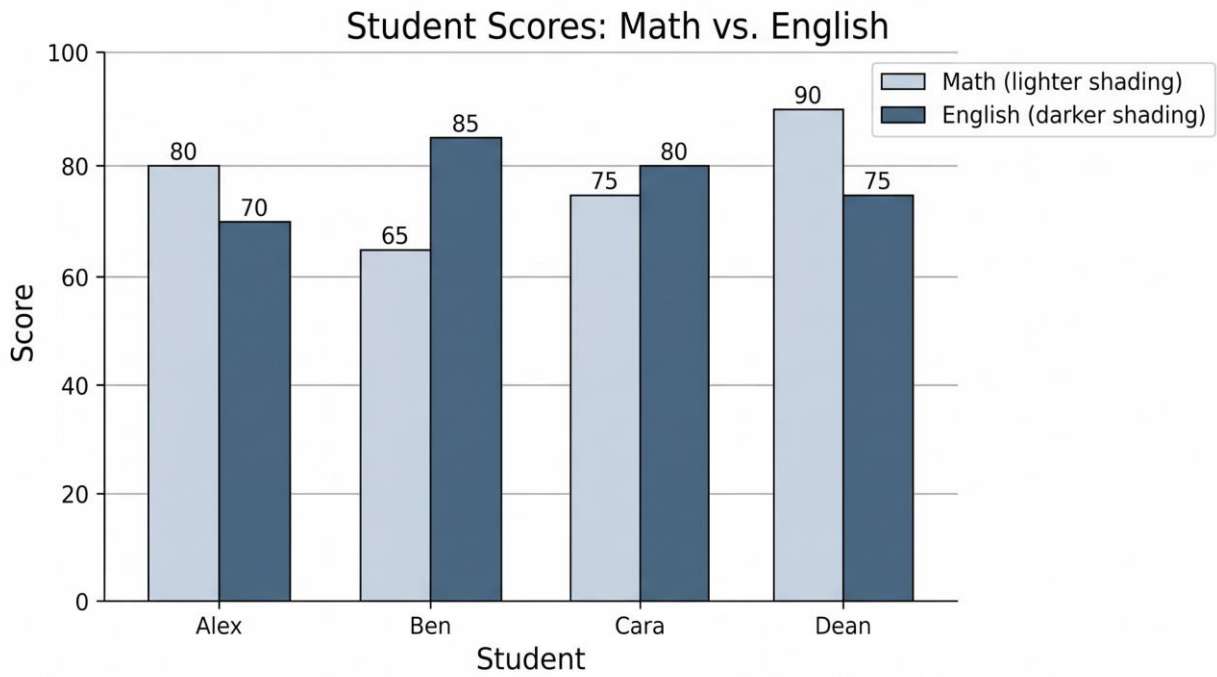
PRACTICE EXAM 23: EQAO GRADE 6 MATHEMATICS SIMULATION (44 QUESTIONS)

STAGE 1 (Questions 1-11) — 30 minutes

1. (Number Sense) What is the value of the digit 9 in the number 591,486,237?
A) 9,000,000
B) 900,000
C) 90,000,000
D) 90,000
2. (Algebra) In a pattern, each term is calculated as "previous term \times 3, then minus 4." If the first term is 5, what is the third term?
A) 11
B) 29
C) 33
D) 87
3. (Spatial Sense) A square has a perimeter of 60 cm. What is the area of the square?
A) 360 cm^2
B) 60 cm^2
C) 180 cm^2
D) 225 cm^2
4. (Number Sense) Calculate: 18.25×4

- A) 73
- B) 72.5
- C) 75
- D) 71.5

5. (Data Literacy) The double bar graph compares Math and English scores for four students.



Which student has the largest gap between their Math and English scores?

- A) Alex
- B) Cara
- C) Ben
- D) Dean

6. (Number Sense) What is $\frac{3}{4} \div \frac{1}{8}$?

- A) 6
- B) $\frac{3}{32}$
- C) $\frac{1}{6}$

D) $\frac{4}{24}$

7. (Financial Literacy) A bicycle priced at \$480 is on sale for 15% off. After the discount, an additional 12% sales tax is applied to the sale price. What is the final price?

A) \$432.96

B) \$441.84

C) \$451.20

D) \$456.96

8. (Algebra) Solve for w : $7w + 4 = 4w + 22$

A) 4

B) 6

C) 8

D) 9

9. (Spatial Sense) How many faces does a pentagonal pyramid have?

A) 4

B) 5

C) 6

D) 7

10. (Number Sense) Order these numbers from greatest to least: $\frac{4}{5}$, 0.85, $\frac{7}{10}$, $\frac{3}{4}$

A) 0.85, $\frac{4}{5}$, $\frac{3}{4}$, $\frac{7}{10}$

B) $\frac{7}{10}$, $\frac{3}{4}$, $\frac{4}{5}$, 0.85

C) 0.85, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{7}{10}$

D) $\frac{4}{5}$, 0.85, $\frac{7}{10}$, $\frac{3}{4}$

11. (Algebra) A linear pattern follows the rule $t = 6n - 4$. What value of n gives $t = 50$?

A) 7

- B) 9
- C) 11
- D) 13

STAGE 2 (Questions 12-22) — 30 minutes

12. (Number Sense) What is the greatest common factor (GCF) of 56 and 84?

- A) 7
- B) 14
- C) 12
- D) 28

13. (Spatial Sense) A triangle has vertices at A(2, 1), B(8, 1), and C(5, 6). What is the area of the triangle?

- A) 30 sq units
- B) 12 sq units
- C) 15 sq units
- D) 18 sq units

14. (Data Literacy) Find the mean of this data set: 22, 18, 25, 30, 15.

- A) 22
- B) 24
- C) 25
- D) 18

15. (Number Sense) What is $0.45 + 1 \frac{1}{4}$ expressed as a mixed number?

- A) $1 \frac{9}{20}$
- B) 1.55
- C) $1 \frac{3}{4}$

D) $1\frac{7}{10}$

16. (Algebra) What is the next term in this sequence: 4, 9, 19, 39, 79, ___?

A) 119

B) 159

C) 158

D) 161

17. (Financial Literacy) Emma earns \$12 per hour and works 25 hours per week. After working for 4 weeks, what are her total earnings?

A) \$1,200

B) \$1,000

C) \$800

D) \$1,500

18. (Number Sense) Evaluate: $2^3 \times 3^2 - 5^2$

A) 17

B) 32

C) 47

D) 55

19. (Spatial Sense) A regular polygon has each exterior angle measuring 30° . How many sides does it have?

A) 6

B) 12

C) 10

D) 8

20. (Data Literacy) The mean of 6 numbers is 30. Five of the numbers are 24, 28, 35, 31, and 33. What is the sixth number?

- A) 25
- B) 27
- C) 31
- D) 29

21. (Algebra) Solve for x : $3(x + 4) - x = 20$

- A) 4
- B) 6
- C) 8
- D) 10

22. (Number Sense) Calculate: $12.6 \div 0.7$

- A) 16
- B) 17
- C) 18
- D) 19

STAGE 3 (Questions 23-33) — 30 minutes

23. (Spatial Sense) A circle has a circumference of 18.84 cm. What is the radius? (Use $\pi \approx 3.14$)

- A) 6 cm
- B) 12 cm
- C) 1.5 cm
- D) 3 cm

24. (Number Sense) Round 4,572,963 to the nearest hundred thousand.

- A) 4,500,000

- B) 4,600,000
- C) 4,570,000
- D) 4,572,000

25. (Algebra) A taxi service charges a \$4.50 base fare plus \$1.75 per kilometer. If a customer paid \$16.75 for a trip, how many kilometers were traveled?

- A) 5 km
- B) 6 km
- C) 7 km
- D) 8 km

26. (Data Literacy) A bag contains 30 marbles: 12 red, 8 blue, 7 green, and 3 yellow. If one marble is drawn at random, what is the probability it is NOT green, in simplest form?

- A) $\frac{23}{30}$
- B) $\frac{7}{30}$
- C) $\frac{1}{4}$
- D) $\frac{7}{23}$

27. (Number Sense) What is $\frac{4}{9}$ expressed as a percent, rounded to the nearest whole number?

- A) 40%
- B) 44%
- C) 45%
- D) 50%

28. (Financial Literacy) Carlos puts \$850 in a savings account at 5% simple interest per year. After how many years will his account total \$1,062.50?

- A) 3 years
- B) 4 years
- C) 6 years

D) 5 years

29. (Spatial Sense) A rectangular prism has a base of $8 \text{ cm} \times 5 \text{ cm}$ and a height of 6 cm. What is the total surface area?

A) 144 cm^2

B) 240 cm^2

C) 236 cm^2

D) 220 cm^2

30. (Algebra) In a sequence, the rule is $t = 3n^2 + 1$. What is the 4th term?

A) 49

B) 37

C) 41

D) 45

31. (Number Sense) Calculate: $-15 + 8 - (-4) + (-7)$

A) -34

B) 12

C) -4

D) -10

32. (Data Literacy) In a class, 7 students walk to school, 5 ride bikes, 8 take the bus, and 4 are driven by parents. What is the ratio of walkers to total students, in simplest form?

A) 7:17

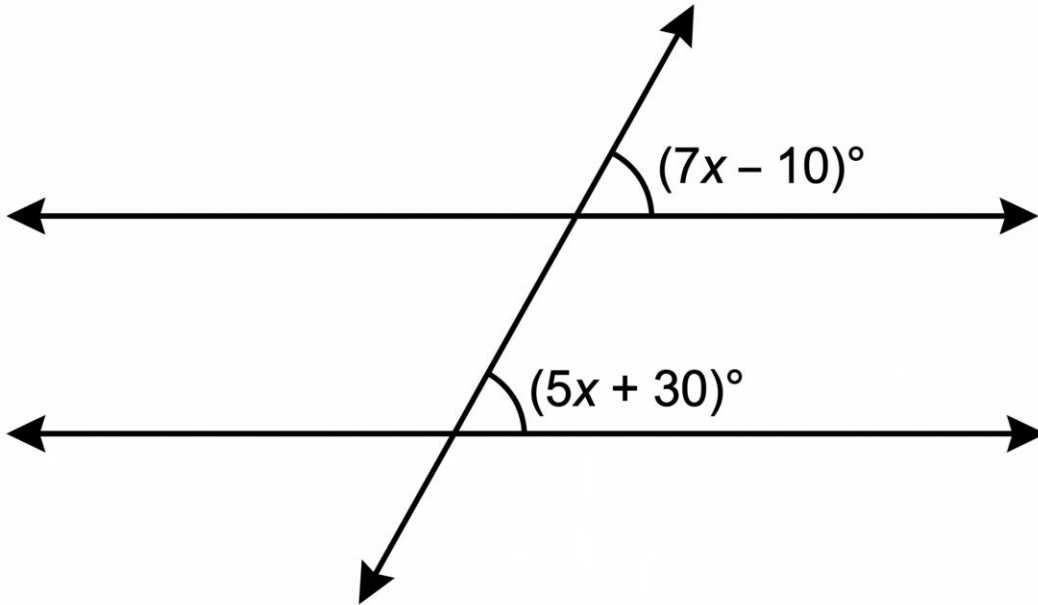
B) 7:24

C) 1:3

D) 7:5

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

[Figure PQ-2: Clean black-line diagram on white background.]



What is the value of x ?

- A) 10
- B) 15
- C) 20
- D) 25

STAGE 4 (Questions 34-44) — 30 minutes

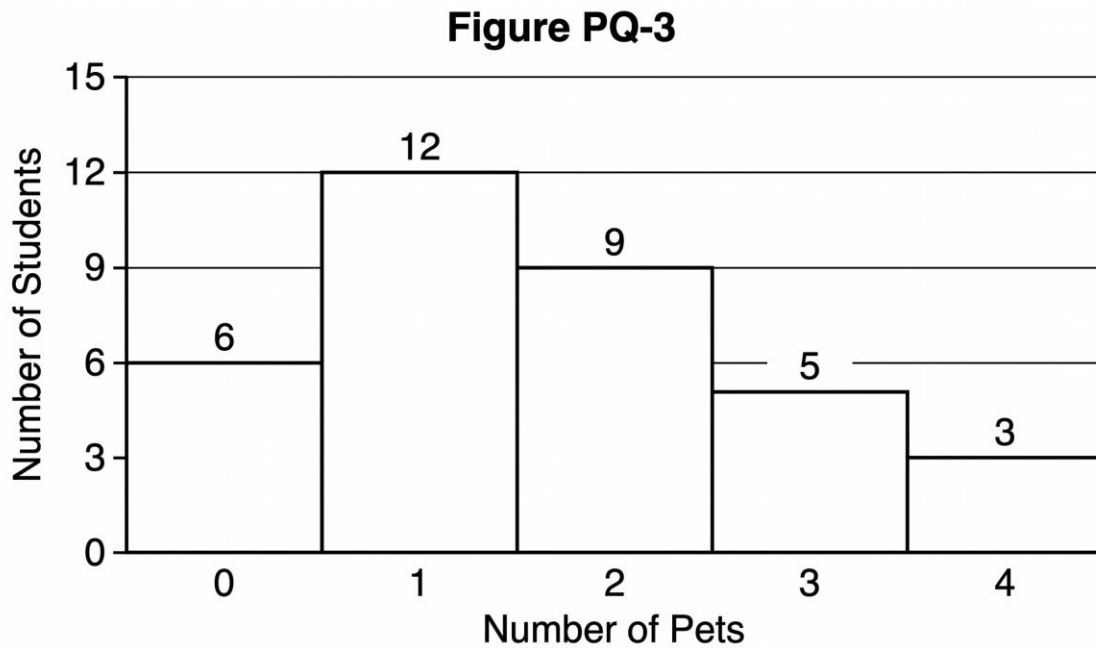
34. (Data Literacy) A survey found that 3 out of every 5 people prefer cats over dogs. In a group of 75 people, how many prefer cats?

- A) 45
- B) 30
- C) 50
- D) 25

35. (Algebra) Which expression simplifies to $5x + 10$?

- A) $4(x + 2) + x$
- B) $5(x + 2)$
- C) $2(2x + 5) + 1$
- D) $3x + 5 + 2x$

36. (Data Literacy) The histogram shows the number of pets owned by students in a class.



What is the total number of students surveyed?

- A) 30
- B) 32
- C) 33
- D) 35

37. (Spatial Sense) A rectangle has a length of $(2x + 3)$ cm and a width of $(x - 1)$ cm. Which expression represents its perimeter?

- A) $6x + 4$
- B) $4x + 4$

- C) $6x + 2$
- D) $8x + 4$

38. (Number Sense) Evaluate: $4 \times (15 - 9)^2 \div 12 + 5$

- A) 13
- B) 15
- C) 17
- D) 19

39. (Financial Literacy) A pair of jeans costs \$50. The store has a "buy one, get the second 50% off" sale. What is the total cost for 2 pairs?

- A) \$50
- B) \$75
- C) \$25
- D) \$100

40. (Algebra) A rectangle has a perimeter of 32 cm. Its length is 4 cm more than its width. What is the area of the rectangle?

- A) 48 cm^2
- B) 64 cm^2
- C) 72 cm^2
- D) 60 cm^2

41. (Number Sense) A jar of cookies contains $\frac{1}{4}$ chocolate chip, $\frac{1}{3}$ oatmeal, and $\frac{1}{6}$ sugar cookies, with the rest being shortbread. What fraction of the cookies are shortbread?

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

42. (Data Literacy) In a survey of 200 students, 90 chose math as their favorite subject. What percentage chose subjects other than math?

- A) 45%
- B) 55%
- C) 50%
- D) 65%

43. (Spatial Sense) A right triangle has legs measuring 9 cm and 12 cm, with a hypotenuse of 15 cm. What is the perimeter of the triangle?

- A) 21 cm
- B) 27 cm
- C) 30 cm
- D) 36 cm

44. (Number Sense) A car uses 5 liters of fuel to travel 60 km. At the same rate, how much fuel will it use to travel 264 km?

- A) 18 L
- B) 20 L
- C) 22 L
- D) 24 L

Practice Exam 23: Answer Key and Explanations

1. C — The digit 9 occupies the ten-millions place in 591,486,237. Counting positions from right (ones, tens, hundreds, thousands, ten-thousands, hundred-thousands, millions, ten-millions), the digit 9 sits in the eighth position with a value of $9 \times 10,000,000 = 90,000,000$. Place value identification underlies all operations with large numbers.

2. B — Apply the compound rule "multiply by 3, then subtract 4" twice: term 1 = 5, term 2 = $(5 \times 3) - 4 = 11$, term 3 = $(11 \times 3) - 4 = 29$. Each new term uses the previous term as input, with both operations applied in the specified sequence.

3. D — A square has four equal sides, so side length = $60 \div 4 = 15$ cm. Area = side² = $15^2 = 225$ cm². Perimeter problems must be converted to side length before applying the area formula. Squaring the side gives the area in square units.

- 4. A** — Multiply 18.25×4 : think of $1825 \times 4 = 7,300$, then place the decimal two positions from the right (since 18.25 has two decimal places): $73.00 = 73$. Verification: $18 \times 4 = 72$, plus $0.25 \times 4 = 1$, totals 73 ✓.
- 5. C** — Calculate each student's gap: Alex $|80-70| = 10$, Ben $|65-85| = 20$, Cara $|75-80| = 5$, Dean $|90-75| = 15$. Ben has the largest gap at 20 points. Comparing differences between paired values reveals which category shows the greatest variation.
- 6. A** — Dividing by a fraction equals multiplying by its reciprocal: $3/4 \div 1/8 = 3/4 \times 8/1 = 24/4 = 6$. The reciprocal of $1/8$ is $8/1$. Verification: $6 \times 1/8 = 6/8 = 3/4$ ✓. Dividing by a small fraction yields a result larger than the original.
- 7. D** — Calculate discount: 15% of $\$480 = 0.15 \times \$480 = \$72$. Sale price: $\$480 - \$72 = \$408$. Calculate tax on sale price: 12% of $\$408 = 0.12 \times \$408 = \$48.96$. Final price: $\$408 + \$48.96 = \$456.96$. Tax is applied to the discounted price, not the original.
- 8. B** — Solve by moving variables to one side: $7w + 4 = 4w + 22 \rightarrow 7w - 4w = 22 - 4 \rightarrow 3w = 18 \rightarrow w = 6$. Check: $7(6) + 4 = 46$ and $4(6) + 22 = 46$ ✓. Variables on both sides require combining like terms before isolating.
- 9. C** — A pentagonal pyramid has 6 faces total: 1 pentagonal base plus 5 triangular faces meeting at the apex. The number of lateral faces in any pyramid equals the number of sides on the base, plus 1 for the base itself.
- 10. A** — Convert all to decimals for comparison: $4/5 = 0.80$, 0.85 , $7/10 = 0.70$, $3/4 = 0.75$. Order from greatest to least: $0.85, 0.80, 0.75, 0.70 \rightarrow 0.85, 4/5, 3/4, 7/10$. Converting to a common form enables direct comparison of fractions and decimals.
- 11. B** — Substitute and solve: $6n - 4 = 50 \rightarrow 6n = 54 \rightarrow n = 9$. Check: $6(9) - 4 = 54 - 4 = 50$ ✓. Linear pattern formulas allow direct calculation of which term number produces a specific value by reversing the operations.
- 12. D** — Find prime factorizations: $56 = 2^3 \times 7$ and $84 = 2^2 \times 3 \times 7$. GCF uses the lowest power of each shared prime: $2^2 \times 7 = 4 \times 7 = 28$. Verification: $56 \div 28 = 2$ and $84 \div 28 = 3$ ✓. GCF is the largest number dividing both evenly.
- 13. C** — Find the base length: AB is horizontal from $(2, 1)$ to $(8, 1)$, so $AB = 8 - 2 = 6$ units. Height is the vertical distance from $C(5, 6)$ to line AB: $6 - 1 = 5$ units. Area = $(1/2)(6)(5) = 15$ square units.
- 14. A** — Sum the values: $22 + 18 + 25 + 30 + 15 = 110$. Divide by the count: $110 \div 5 = 22$. The mean represents the balance point of the data, where the sum of deviations above equals the sum of deviations below.
- 15. D** — Convert 0.45 to a fraction: $0.45 = 45/100 = 9/20$. Convert to twentieths: $1 \frac{1}{4} = 1 \frac{5}{20}$. Add: $9/20 + 1 \frac{5}{20} = 1 \frac{14}{20} = 1 \frac{7}{10}$. Alternatively, work in decimals: $0.45 + 1.25 = 1.70 = 1 \frac{7}{10}$. ✓

- 16. B** — The differences between consecutive terms double each time: $9-4=5$, $19-9=10$, $39-19=20$, $79-39=40$. The next difference is $40 \times 2 = 80$. Apply: $79 + 80 = 159$. Patterns where differences themselves follow a rule reveal compound growth.
- 17. A** — Calculate weekly earnings: $\$12/\text{hour} \times 25 \text{ hours} = \300 per week. Multiply by 4 weeks: $\$300 \times 4 = \$1,200$. Income calculations require multiplying hourly rate by hours per period, then by the number of periods.
- 18. C** — Apply order of operations: exponents first: $2^3 = 8$ and $3^2 = 9$ and $5^2 = 25$. Then multiplication: $8 \times 9 = 72$. Finally subtraction: $72 - 25 = 47$. BEDMAS sequences these operations correctly. ✓
- 19. B** — The sum of exterior angles of any polygon equals 360° . Divide by each exterior angle: $360^\circ \div 30^\circ = 12$ sides. This is a dodecagon. The exterior angle formula provides a direct path to determining the number of sides.
- 20. D** — Calculate the required total: $6 \times 30 = 180$. Add the five given numbers: $24 + 28 + 35 + 31 + 33 = 151$. Subtract to find the missing value: $180 - 151 = 29$. Working backward from the mean requires finding the required sum, then the missing addend.
- 21. A** — Apply distributive property and solve: $3(x + 4) - x = 20 \rightarrow 3x + 12 - x = 20 \rightarrow 2x + 12 = 20 \rightarrow 2x = 8 \rightarrow x = 4$. Check: $3(4 + 4) - 4 = 24 - 4 = 20$ ✓. Distribute before combining like terms.
- 22. C** — To divide decimals, multiply both numerator and denominator by 10: $12.6 \div 0.7 = 126 \div 7 = 18$. Verification: $0.7 \times 18 = 12.6$ ✓. Eliminating decimals from the divisor simplifies the calculation while preserving the ratio.
- 23. D** — Use the circumference formula: $C = 2\pi r$. Solve for r: $18.84 = 2 \times 3.14 \times r \rightarrow 18.84 = 6.28r \rightarrow r = 3 \text{ cm}$. Verification: $2 \times 3.14 \times 3 = 18.84$ ✓. Rearranging the formula isolates the unknown variable.
- 24. B** — To round 4,572,963 to the nearest hundred thousand, examine the digit immediately to the right (ten-thousands place): 7. Since $7 \geq 5$, round up. The hundred-thousands digit increases from 5 to 6: 4,600,000. Digits to the right become zero.
- 25. C** — Subtract the base fare: $\$16.75 - \$4.50 = \$12.25$ for distance charges. Divide by the per-kilometer rate: $\$12.25 \div \$1.75 = 7 \text{ km}$. Verification: $\$4.50 + (7 \times \$1.75) = \$4.50 + \$12.25 = \$16.75$ ✓. Two-part pricing problems require separating fixed and variable costs.
- 26. A** — Find the number of non-green marbles: $30 - 7 = 23$. Probability of NOT green = $23/30$. Since $\text{GCF}(23, 30) = 1$, the fraction is already in simplest form. Complementary probability calculates the chance an event does NOT occur.
- 27. B** — Convert $4/9$ to a decimal: $4 \div 9 = 0.4444\dots$ Convert to percent: $0.4444 \times 100 = 44.44\%$. Rounded to the nearest whole number: 44%. Repeating decimals must be rounded according to the specified precision.

- 28. D** — Calculate the interest earned: $\$1,062.50 - \$850 = \$212.50$. Use $I = P \times r \times t$: $\$212.50 = \$850 \times 0.05 \times t \rightarrow \$212.50 = \$42.50t \rightarrow t = 5$ years. Working backward isolates the time variable from the interest formula.
- 29. C** — A rectangular prism has 6 faces in 3 pairs. Calculate each pair: $2(8 \times 5) = 80$, $2(8 \times 6) = 96$, $2(5 \times 6) = 60$. Total surface area: $80 + 96 + 60 = 236 \text{ cm}^2$. The formula $SA = 2(lw + lh + wh)$ systematically accounts for all faces.
- 30. A** — Substitute $n = 4$ into $t = 3n^2 + 1$: $t = 3(4^2) + 1 = 3(16) + 1 = 48 + 1 = 49$. Order of operations requires squaring before multiplying. Quadratic patterns grow faster than linear ones because of the squared term.
- 31. D** — Apply integer rules left to right: $-15 + 8 = -7$. Then $-7 - (-4) = -7 + 4 = -3$. Finally $-3 + (-7) = -3 - 7 = -10$. Subtracting a negative becomes adding a positive; adding a negative becomes subtracting. Careful sign tracking is essential.
- 32. B** — Calculate total students: $7 + 5 + 8 + 4 = 24$. Walkers to total ratio: $7:24$. Since $\text{GCF}(7, 24) = 1$, the ratio is already in simplest form. Part-to-whole ratios compare a subset against the complete group.
- 33. C** — Corresponding angles formed by parallel lines and a transversal are equal: $7x - 10 = 5x + 30$. Subtract $5x$ from both sides: $2x - 10 = 30$. Add 10: $2x = 40$. Divide by 2: $x = 20$. Check: $7(20) - 10 = 130$ and $5(20) + 30 = 130 \checkmark$.
- 34. A** — Set up the proportion: $\frac{3}{5}$ of 75 = $(3 \times 75)/5 = 225/5 = 45$ people. Alternatively, $75 \div 5 = 15$ (one part), then $15 \times 3 = 45$ (three parts). Ratios scale proportionally when applied to larger groups.
- 35. B** — Simplify each option: A: $4(x+2) + x = 4x + 8 + x = 5x + 8$; B: $5(x+2) = 5x + 10 \checkmark$; C: $2(2x+5) + 1 = 4x + 11$; D: $3x + 5 + 2x = 5x + 5$. Only option B simplifies to exactly $5x + 10$.
- 36. D** — Sum the frequency for each category: $6 + 12 + 9 + 5 + 3 = 35$ students total. Reading a histogram requires adding the height of every bar, since each bar represents a count for that interval or value. The sum gives the total sample size.
- 37. A** — Perimeter formula for a rectangle: $P = 2L + 2W$. Substitute and expand: $P = 2(2x + 3) + 2(x - 1) = 4x + 6 + 2x - 2 = 6x + 4$. Combine like terms after distributing each multiplier. Algebraic perimeter expressions follow the same formula as numerical ones.
- 38. C** — Apply order of operations: brackets first: $(15 - 9) = 6$. Exponent: $6^2 = 36$. Multiplication: $4 \times 36 = 144$. Division: $144 \div 12 = 12$. Addition: $12 + 5 = 17$. BEDMAS sequences these operations correctly without ambiguity.
- 39. B** — First pair at full price: $\$50$. Second pair at 50% off: $\$50 \times 0.50 = \25 . Total: $\$50 + \$25 = \$75$. The "buy one, get second half off" promotion applies the discount only to the second item, not both. Understanding promotional language affects budget calculations.

40. D — Let w = width and $L = w + 4$. Apply perimeter formula: $2(w + 4) + 2w = 32 \rightarrow 2w + 8 + 2w = 32 \rightarrow 4w = 24 \rightarrow w = 6$. Then $L = 10$. Area = $L \times W = 10 \times 6 = 60 \text{ cm}^2$. Verify perimeter: $2(10) + 2(6) = 32 \checkmark$.

41. A — Find common denominator (12): $1/4 = 3/12$, $1/3 = 4/12$, $1/6 = 2/12$. Sum of known: $3/12 + 4/12 + 2/12 = 9/12$. Shortbread = $12/12 - 9/12 = 3/12 = 1/4$ in simplest form. Complementary fractions sum to one whole.

42. B — Find non-math preferences: $200 - 90 = 110$ students. Convert to percentage: $(110/200) \times 100 = 55\%$. Alternatively, math fraction = $90/200 = 45\%$, so other subjects = $100\% - 45\% = 55\%$. Complementary percentages always sum to 100%.

43. D — Add all three sides of the triangle: $9 + 12 + 15 = 36 \text{ cm}$. Perimeter is the total distance around any polygon, found by summing all side lengths. The given hypotenuse value eliminates the need for the Pythagorean theorem calculation.

44. C — Calculate fuel efficiency: $60 \text{ km} \div 5 \text{ L} = 12 \text{ km per liter}$. Divide total distance by efficiency rate: $264 \div 12 = 22$ liters. Verification: $22 \times 12 = 264 \text{ km} \checkmark$. Unit rates enable scaling from one quantity to any other proportional quantity.