

PRACTICE EXAM 11: SIMULATION (50 QUESTIONS)

Time: Two sessions of 60 minutes each (recommended)

Total questions: 50

Calculator and EQAO Grade 9 formula sheet permitted.

1. Solve for x in the equation $6x - 4 = 2x + 20$.

- A. 3
- B. 4
- C. 5
- D. 6

2. Simplify the expression $x^8 \div x^5$.

- A. x^{13}
- B. x^3
- C. x^{40}
- D. x^{-3}

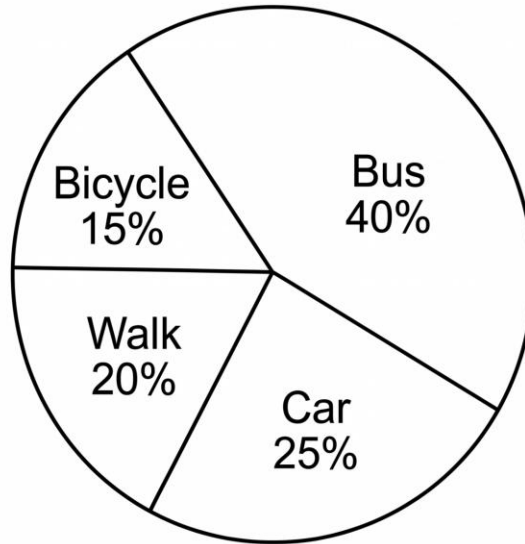
3. A right triangle has legs measuring 7 cm and 24 cm. What is the length of the hypotenuse?

- A. 25 cm
- B. 31 cm
- C. 17 cm

D. 23 cm

4. Look at the circle graph below showing how 200 students travel to school. How many students walk?

How 200 Students Travel to School



A. 20

B. 50

C. 40

D. 30

5. Solve for x in the equation $(\frac{1}{2})(4x - 6) = 9$.

A. 3

B. 6

C. 9

D. 4.5

6. What is the total amount (principal plus interest) when \$2,000 is invested at 4% simple interest for 3 years? (I = Prt.)

- A. \$2,080
- B. \$2,400
- C. \$2,120
- D. \$2,240

7. The formula $F = (9/5)C + 32$ converts a Celsius temperature to Fahrenheit. What is 20°C in degrees Fahrenheit?

- A. 52°F
- B. 36°F
- C. 68°F
- D. 93°F

8. What is the value of 4^{-2} ?

- A. $1/16$
- B. -16
- C. -8
- D. 16

9. A triangle has a base of 14 cm and a height of 9 cm. What is its area?

- A. 63 cm^2
- B. 126 cm^2
- C. 23 cm^2
- D. 46 cm^2

10. Which of the following tables represents a linear relation?

A. $x: 1, 2, 3, 4 \rightarrow y: 1, 4, 9, 16$

B. $x: 1, 2, 3, 4 \rightarrow y: 2, 4, 8, 16$

C. $x: 1, 2, 3, 4 \rightarrow y: 5, 8, 11, 14$

D. $x: 1, 2, 3, 4 \rightarrow y: 1, 3, 6, 10$

11. A standard six-sided die is rolled. What is the probability of rolling an even number?

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{2}{3}$

D. $\frac{1}{2}$

12. Simplify the expression $8a - 5b - 3a + 2b$.

A. $2ab$

B. $5a - 3b$

C. $5a + 3b$

D. $11a - 3b$

13. Evaluate the expression $(6 + 2)^2 \div 4 - 5$.

A. 21

B. 9

C. 27

D. 11

14. Solve for x in the proportion $x/6 = 10/15$.

- A. 4
- B. 9
- C. 25
- D. 2.5

15. A rectangular box has a volume of 240 cm^3 and a base area of 30 cm^2 . What is its height?

- A. 7,200 cm
- B. 8 cm
- C. 210 cm
- D. 270 cm

16. A meal costs \$48. With an 18% tip added, what is the total amount paid?

- A. \$8.64
- B. \$48.18
- C. \$56.64
- D. \$66.00

17. Expand and simplify the product $(x - 3)(x - 5)$.

- A. $x^2 + 15$
- B. $x^2 - 8x + 15$
- C. $x^2 - 2x - 15$
- D. $x^2 + 8x + 15$

18. Find the mean of the data set 6, 11, 8, 15, 10.

- A. 10
- B. 11
- C. 9
- D. 8

19. Express the number 0.00067 in scientific notation.

- A. 6.7×10^4
- B. 67×10^{-5}
- C. 6.7×10^{-4}
- D. 6.7×10^{-3}

20. A line has a slope of -2 and passes through the point $(1, 3)$. What is its y-intercept?

- A. 1
- B. 3
- C. -2
- D. 5

21. A circle has a circumference of 62.8 cm. What is its radius? ($C = 2\pi r$, use $\pi \approx 3.14$.)

- A. 10 cm
- B. 20 cm
- C. 31.4 cm
- D. 5 cm

22. Solve the inequality $5x - 3 < 2x + 9$ for x .

- A. $x > 4$
- B. $x > -4$
- C. $x < -4$
- D. $x < 4$

23. A data set is 23, 8, 19, 31, 14. What is the range of the data set?

- A. 19
- B. 31
- C. 23
- D. 17

24. What is 35% of 240?

- A. 75
- B. 84
- C. 96
- D. 68.5

25. If $a = 4$ and $b = 3$, what is the value of the expression $a^2 - 2ab + b^2$?

- A. 49
- B. 1
- C. 7
- D. 25

26. A 12-pack of juice costs \$5.40 and a 20-pack costs \$8.40. Which is the better value, and what is its unit price?

- A. 12-pack, at \$0.42 each
- B. 20-pack, at \$0.45 each
- C. 20-pack, at \$0.42 each
- D. both cost the same per unit

27. The area of a triangle is given by $A = (1/2)bh$. Rearranged to solve for h , the formula becomes:

- A. $h = A/(2b)$
- B. $h = 2Ab$
- C. $h = Ab/2$
- D. $h = 2A/b$

28. In a triangle, two interior angles measure 55° and 65° . What is the measure of the exterior angle adjacent to the third angle?

- A. 120°
- B. 60°
- C. 110°
- D. 130°

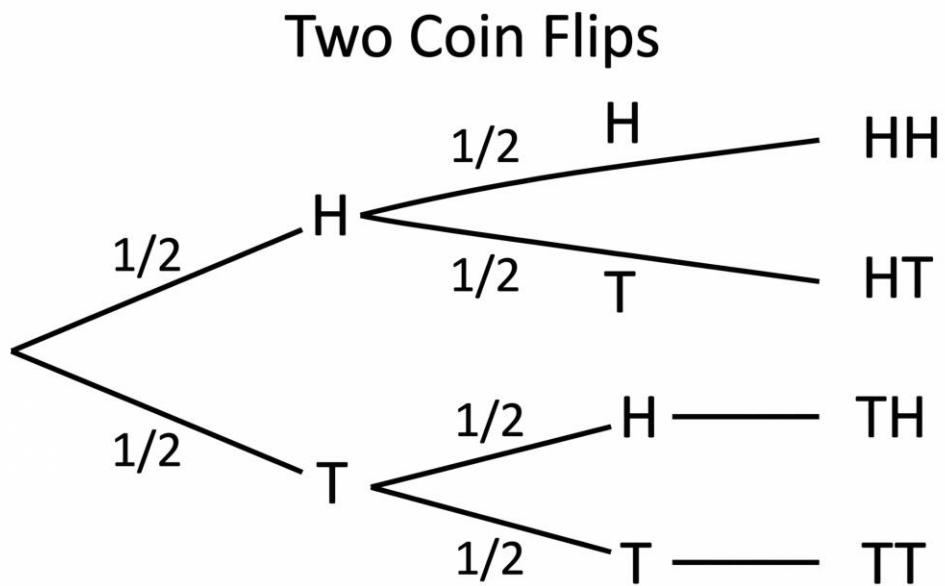
29. What is the least common multiple of 4 and 10?

- A. 2
- B. 40
- C. 14
- D. 20

30. Solve for x in the equation $x/4 + 2 = 5$.

- A. 28
- B. 7
- C. 12
- D. 3

31. Look at the tree diagram below for flipping a coin twice. What is the probability of getting exactly one head?



- A. $1/4$
- B. $1/2$
- C. $3/4$
- D. $1/3$

32. An arithmetic sequence has a first term of 3 and a common difference of 5. What is the 8th term?

- A. 38
- B. 40
- C. 43
- D. 35

33. Express $\frac{7}{20}$ as a percentage.

- A. 14%
- B. 35%
- C. 70%
- D. 20%

34. Expand the product $(x - 6)(x + 6)$.

- A. $x^2 + 36$
- B. $x^2 - 12x - 36$
- C. $x^2 + 12x + 36$
- D. $x^2 - 36$

35. A triangular prism has two triangular faces, each with an area of 12 cm^2 , and three rectangular faces with areas of 30 cm^2 , 40 cm^2 , and 50 cm^2 . What is its total surface area?

- A. 144 cm^2
- B. 132 cm^2
- C. 120 cm^2
- D. 156 cm^2

36. A data set is 4, 7, 7, 9, 11, 11, 13. What are the modes of this data set?

- A. only the value 7
- B. only the value 11
- C. both 7 and 11
- D. there is no mode

37. Solve the system $x + 2y = 11$ and $x - 2y = 3$. What is the value of x ?

- A. 2
- B. 4
- C. 5
- D. 7

38. A real-estate agent earns 3% commission on a \$250,000 home sale. How much is the commission?

- A. \$750
- B. \$75,000
- C. \$7,500
- D. \$2,500

39. What is the value of the expression $|-12| - |-5|$?

- A. 7
- B. 17
- C. -7
- D. -17

40. The sum of three consecutive integers is 60. What is the middle integer?

- A. 19
- B. 20
- C. 21
- D. 18

41. A bag has 3 green and 5 yellow marbles. Two marbles are drawn without replacement. What is the probability that both are green?

- A. $\frac{3}{28}$
- B. $\frac{9}{64}$
- C. $\frac{1}{8}$
- D. $\frac{6}{15}$

42. Simplify the expression $(4x^3)(3x^2)$.

- A. $7x^5$
- B. $12x^6$
- C. $12x^5$
- D. $7x^6$

43. A cube has an edge length of 4 cm. What is its volume?

- A. 16 cm^3
- B. 64 cm^3
- C. 48 cm^3
- D. 12 cm^3

44. A sum of \$360 is shared in the ratio 4 : 5. What is the smaller share?

- A. \$200
- B. \$90
- C. \$144
- D. \$160

45. The parabola $y = 2(x - 1)^2 + 4$ has its vertex at which point?

- A. (-1, 4)
- B. (1, -4)
- C. (2, 4)
- D. (1, 4)

46. A bar graph's vertical axis starts at 90 instead of 0, making small differences appear large. What is this an example of?

- A. A representative sample
- B. A misleading graph
- C. A line of best fit
- D. A random survey

47. A \$200 coat is 25% off. After a 13% tax is applied to the sale price, what is the final cost?

- A. \$174.00
- B. \$150.00
- C. \$169.50
- D. \$226.00

48. A square has a side length of 6 cm. What is the length of its diagonal, to the nearest tenth? (Use the Pythagorean theorem.)

- A. 8.5 cm
- B. 12 cm
- C. 6 cm
- D. 36 cm

49. A monthly income of \$4,000 is split as 40% housing, 30% food, 20% transport, and the rest to savings. How much is saved?

- A. \$800
- B. \$400
- C. \$1,000
- D. \$600

50. Evaluate the expression $2.4 \times 5 - 6 \div 0.5$.

- A. 6
- B. 18
- C. 9
- D. 0

Practice Exam 11: Answer Key and Full Explanations

- 1. D** — Collect variables on one side: subtracting $2x$ and adding 4 gives $4x = 24$, so $x = 6$. Moving terms across the equals sign reverses their operation.
- 2. B** — The quotient rule subtracts exponents of like bases: $x^8 \div x^5 = x^{8-5} = x^3$. Dividing powers of the same base subtracts the exponents.
- 3. A** — The hypotenuse is found with the Pythagorean theorem: $\sqrt{(7^2 + 24^2)} = \sqrt{(49 + 576)} = \sqrt{625} = 25$ cm. This is the 7-24-25 right-triangle relationship.
- 4. C** — Walking accounts for 20% of the 200 students: $0.20 \times 200 = 40$ students. The percentage from the circle graph is applied to the total.
- 5. B** — Distribute the one-half: $(1/2)(4x - 6) = 2x - 3$, so $2x - 3 = 9$. Adding 3 and dividing by 2 gives $x = 6$. Distributing first clears the fractional coefficient.
- 6. D** — Simple interest is $I = Prt = 2,000 \times 0.04 \times 3 = \240 . The total amount is principal plus interest: $2,000 + 240 = \$2,240$. The question asks for the full balance, not just the interest.
- 7. C** — Substitute $C = 20$ into $F = (9/5)C + 32$: $(9/5)(20) + 32 = 36 + 32 = 68^\circ\text{F}$. The multiplication is completed before adding 32.
- 8. A** — A negative exponent gives the reciprocal of the positive power: $4^{-2} = 1/4^2 = 1/16$. The result is a positive fraction, not a negative number.
- 9. A** — Area of a triangle is one-half base times height: $(1/2)(14)(9) = (1/2)(126) = 63 \text{ cm}^2$. The one-half factor distinguishes a triangle from a rectangle of the same base and height.
- 10. C** — A linear relation has constant first differences. Table C increases by 3 each step (5, 8, 11, 14), giving a constant rate, while the others have changing differences. A constant difference is the signature of a linear relation.
- 11. D** — Even numbers on a die are 2, 4, and 6 — three favourable outcomes out of six, giving $3/6 = 1/2$. Half the faces are even, so the probability is one-half.
- 12. B** — Group like terms: $8a - 3a = 5a$ and $-5b + 2b = -3b$, giving $5a - 3b$. Only terms with the same variable can be combined.
- 13. D** — Apply order of operations: the bracket first, $(6 + 2)^2 = 8^2 = 64$, then $64 \div 4 = 16$, and $16 - 5 = 11$. Brackets and exponents come before division and subtraction.
- 14. A** — Cross-multiply the proportion: $15x = 6 \times 10 = 60$, so $x = 4$. Cross-multiplication converts the proportion into a solvable equation.

- 15. B** — Volume equals base area times height, so height is volume divided by base area: $240 \div 30 = 8$ cm. Rearranging the volume relationship isolates the height.
- 16. C** — Adding an 18% tip means paying 118% of the meal cost: $48 \times 1.18 = \$56.64$. Multiplying by 1 plus the tip rate combines the meal and tip in one step.
- 17. B** — Apply FOIL: $x \cdot x = x^2$, $x \cdot (-5) = -5x$, $-3 \cdot x = -3x$, $-3 \cdot (-5) = 15$. Combining: $x^2 - 5x - 3x + 15 = x^2 - 8x + 15$. The two negative numbers give a positive constant.
- 18. A** — The mean is the sum divided by the count: $(6 + 11 + 8 + 15 + 10) \div 5 = 50 \div 5 = 10$. Adding all values before dividing gives the average.
- 19. C** — Scientific notation needs a value between 1 and 10 times a power of ten. Moving the decimal four places right to reach 6.7 means the exponent is -4 , giving 6.7×10^{-4} . Small numbers take a negative exponent.
- 20. D** — Substitute the point into $y = mx + b$: $3 = -2(1) + b = -2 + b$. Solving gives $b = 5$. The y-intercept is found by back-substituting the slope and point.
- 21. A** — Rearrange $C = 2\pi r$: $62.8 = 2(3.14)r = 6.28r$, so $r = 62.8 \div 6.28 = 10$ cm. Dividing by 2π recovers the radius from the circumference.
- 22. D** — Subtract $2x$ from both sides: $3x - 3 < 9$. Adding 3 gives $3x < 12$, so $x < 4$. No division by a negative occurs, so the inequality direction stays the same.
- 23. C** — The range is the maximum minus the minimum: $31 - 8 = 23$. The range measures the full spread of the data.
- 24. B** — Convert the percent to a decimal and multiply: $0.35 \times 240 = 84$. Finding a percent of a number is a single multiplication.
- 25. B** — Substitute $a = 4$ and $b = 3$: $4^2 - 2(4)(3) + 3^2 = 16 - 24 + 9 = 1$. This expression is the perfect square $(a - b)^2$, equal to $(4 - 3)^2 = 1$.
- 26. C** — Compare unit prices. The 12-pack: $\$5.40 \div 12 = \0.45 each. The 20-pack: $\$8.40 \div 20 = \0.42 each. The 20-pack is cheaper per unit, making it the better value.
- 27. D** — Multiply both sides of $A = (1/2)bh$ by 2: $2A = bh$. Dividing by b isolates the height: $h = 2A/b$. Each step undoes an operation applied to h .
- 28. A** — The exterior angle of a triangle equals the sum of the two non-adjacent interior angles: $55 + 65 = 120^\circ$. Equivalently, the third interior angle is 60° , and its exterior angle is $180 - 60 = 120^\circ$.
- 29. D** — The least common multiple is the smallest number divisible by both. Multiples of 10 are 10, 20, and 20 is the first also divisible by 4, so the LCM is 20. The LCM is at least as large as the bigger number.

- 30. C** — Subtract 2 from both sides: $x/4 = 3$. Multiplying by 4 gives $x = 12$. The constant is removed before clearing the denominator.
- 31. B** — Exactly one head occurs in two of the four equally likely outcomes, HT and TH, giving $2/4 = 1/2$. The tree shows all four outcomes are equally likely, so counting the favourable ones gives the probability.
- 32. A** — The n th term is $t_n = t_1 + (n - 1)d$: $3 + (8 - 1)(5) = 3 + 35 = 38$. The common difference is added seven times to reach the eighth term.
- 33. B** — Convert the fraction to a decimal then a percent: $7 \div 20 = 0.35 = 35\%$. Dividing the numerator by the denominator gives the decimal form.
- 34. D** — This is a difference of squares: $(x - 6)(x + 6) = x^2 - 6^2 = x^2 - 36$. The middle terms cancel because they are opposites.
- 35. A** — Add the areas of all five faces: the two triangles give $2 \times 12 = 24 \text{ cm}^2$, and the three rectangles give $30 + 40 + 50 = 120 \text{ cm}^2$. The total is $24 + 120 = 144 \text{ cm}^2$. Every face is counted once.
- 36. C** — The mode is the most frequent value, and both 7 and 11 appear twice while all others appear once. A data set with two values tied for most frequent is bimodal, so the modes are 7 and 11.
- 37. D** — Adding the two equations eliminates y : $(x + 2y) + (x - 2y) = 11 + 3$, giving $2x = 14$, so $x = 7$. The opposite y -coefficients cancel when added.
- 38. C** — Commission is the rate times the sale price: $0.03 \times 250,000 = \$7,500$. Converting 3% to a decimal before multiplying gives the amount.
- 39. A** — Absolute value gives distance from zero: $|-12| = 12$ and $|-5| = 5$. Then $12 - 5 = 7$. The bars are evaluated before subtracting.
- 40. B** — Represent the integers as n , $n + 1$, $n + 2$. Their sum is $3n + 3 = 60$, so $n = 19$ and the middle integer is $n + 1 = 20$. The middle value is the second of the three.
- 41. A** — Without replacement, the second probability changes after the first draw: $(3/8)(2/7) = 6/56 = 3/28$. Removing one green marble leaves 2 of 7 for the second draw.
- 42. C** — Multiply coefficients and add exponents: $4 \times 3 = 12$ and $x^3 \times x^2 = x^5$, giving $12x^5$. The product rule adds exponents of like bases.
- 43. B** — Volume of a cube is the edge length cubed: $4^3 = 64 \text{ cm}^3$. All three equal dimensions multiply together.
- 44. D** — The ratio 4 : 5 has $4 + 5 = 9$ parts. The smaller share is $4/9$ of $\$360$: $(4/9) \times 360 = \$160$. Finding the value of all parts is implicit in taking the fraction.

- 45. D** — In vertex form $y = a(x - h)^2 + k$, the vertex is (h, k) . Here $h = 1$ and $k = 4$, so the vertex is $(1, 4)$. The coefficient 2 affects width, not vertex position.
- 46. B** — Starting the vertical axis at 90 rather than 0 exaggerates small differences between bars, distorting the visual comparison. This is a classic example of a misleading graph. A truncated axis can make minor gaps look major.
- 47. C** — Apply the discount first: $200 \times 0.75 = \$150$. Then add 13% tax: $150 \times 1.13 = \$169.50$. The tax is calculated on the reduced sale price, not the original.
- 48. A** — The diagonal of a square is the hypotenuse of a right triangle with both legs equal to the side: $\sqrt{6^2 + 6^2} = \sqrt{72} \approx 8.5$ cm. The two equal sides form the legs of the right triangle.
- 49. B** — Housing, food, and transport total $40\% + 30\% + 20\% = 90\%$, leaving 10% for savings. Calculating 10% of \$4,000: $0.10 \times 4,000 = \$400$. Finding the leftover percentage first is the efficient route.
- 50. D** — Apply order of operations, doing multiplication and division before subtraction: $2.4 \times 5 = 12$ and $6 \div 0.5 = 12$. Then $12 - 12 = 0$. Both operations are completed before the final subtraction.