

PRACTICE EXAM 9: 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 $3(2x - 5) + 4 = 25$.

A. 5

B. 6

C. 7

D. 4

2. Simplify the expression $(a^2)^5$.

A. a^{10}

B. a^7

C. a^{25}

D. a^3

3. A triangle has an area of 48 cm^2 and a base of 12 cm. What is its height? ($A = (1/2)bh$.)

A. 4 cm

B. 12 cm

C. 6 cm

D. 8 cm

4. Five students scored 80, 75, 90, 85, and 70 on a quiz. What is their mean score?

A. 75

B. 85

C. 80

D. 90

5. Solve for x in the equation $(x + 2)/3 = (2x - 1)/5$.

A. 13

B. 7

C. 9

D. 11

6. How much simple interest is earned on \$4,000 at 3.5% per year for 2 years? ($I = Prt$.)

- A. \$140
- B. \$400
- C. \$280
- D. \$420

7. If $x = -3$, what is the value of the expression $2x^2 - 5x + 1$?

- A. 4
- B. 34
- C. -32
- D. 28

8. Express the product $(3 \times 10^4)(2 \times 10^3)$ in scientific notation.

- A. 5×10^7
- B. 6×10^{12}
- C. 5×10^{12}
- D. 6×10^7

9. A right triangle has legs measuring 8 cm and 15 cm. What is the length of the hypotenuse?

- A. 23 cm
- B. 12 cm

C. 17 cm

D. 21 cm

10. A line has a y-intercept of 4 and passes through the point (2, 10). What is the equation of the line?

A. $y = 2x + 4$

B. $y = 4x + 2$

C. $y = x + 8$

D. $y = 3x + 4$

11. A card is drawn at random from a standard deck of 52 cards. What is the probability of drawing a heart?

A. $1/4$

B. $1/13$

C. $1/2$

D. $4/13$

12. Factor the expression $15x^3 - 10x^2$ completely.

A. $5x(3x^2 - 2x)$

B. $5x^2(3x - 2)$

C. $5x^3(3 - 2x)$

D. $15x^2(x - 10)$

13. Evaluate the expression $2\frac{1}{2} - \frac{3}{4}$.

A. $1\frac{1}{4}$

B. $2\frac{1}{4}$

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

D. $1\frac{3}{4}$

14. Solve the inequality $3x - 7 \leq 2x + 1$ for x .

A. $x \geq 8$

B. $x \leq 8$

C. $x \leq 6$

D. $x \geq 6$

15. A box measures 8 cm by 5 cm by 3 cm. What is its volume?

A. 16 cm^3

B. 80 cm^3

C. 120 cm^3

D. 240 cm^3

16. A store buys an item for \$40 and marks it up by 35%. What is the selling price?

- A. \$54
- B. \$14
- C. \$75
- D. \$46

17. Expand and simplify the expression $(x + 4)^2$.

- A. $x^2 + 16$
- B. $x^2 + 8x + 16$
- C. $x^2 + 4x + 16$
- D. $x^2 + 8x + 8$

18. Look at the scatter plot below. Which statement best describes the correlation between the variables?

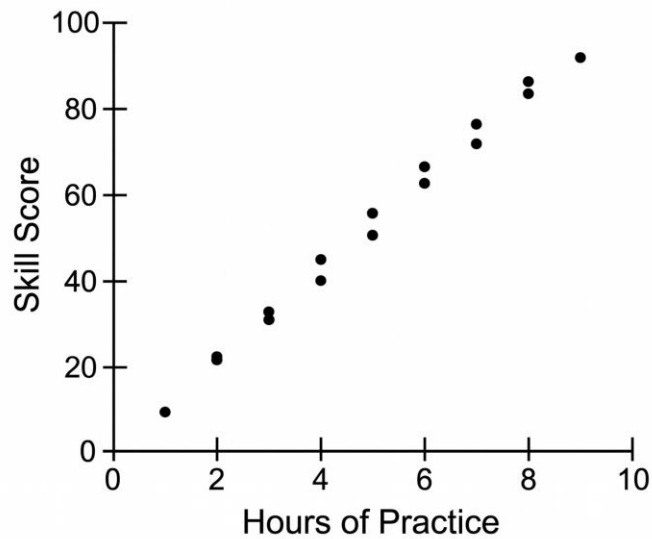


Figure PQ-1: Clean black-line technical scatter plot on a white background.

- A. a weak negative correlation
- B. no correlation
- C. a strong positive correlation
- D. a weak positive correlation

19. What is the value of the expression $|-7| + |3| - |-2|$?

- A. 2
- B. 12
- C. -6
- D. 8

20. Two consecutive even integers have a sum of 50. What is the larger of the two integers?

- A. 26
- B. 24
- C. 28
- D. 25

21. A circular track has a radius of 50 m. What is its circumference, to the nearest whole number? ($C = 2\pi r$, use $\pi \approx 3.14$.)

- A. 157 m
- B. 7,850 m

- C. 314 m
- D. 100 m

22. A linear relation passes through the points (1, 5) and (4, 14). What is its rate of change (slope)?

- A. 3
- B. $\frac{1}{3}$
- C. 9
- D. -3

23. A bag has 4 red and 6 blue marbles. A marble is drawn, its colour noted, and replaced; then a second marble is drawn. What is the probability that both marbles are red?

- A. $\frac{8}{20}$
- B. $\frac{4}{25}$
- C. $\frac{2}{5}$
- D. $\frac{16}{20}$

24. In a school of 800 students, 45% take the bus. How many students take the bus?

- A. 320
- B. 400
- C. 440
- D. 360

25. Solve the system $3x + 2y = 16$ and $3x - y = 4$. What is the value of y ?

A. 4

B. 2

C. 6

D. 8

26. Plan A costs \$30 plus \$0.10 per text. Plan B costs \$20 plus \$0.20 per text. At how many texts do the two plans cost the same?

A. 50 texts

B. 200 texts

C. 150 texts

D. 100 texts

27. Simplify the expression $4 - 3(2x - 5)$.

A. $-6x - 11$

B. $19 - 6x$

C. $2x - 5$

D. $-6x + 9$

28. Two angles form a straight line. One angle is 3 times the size of the other. What is the measure of the larger angle?

A. 45°

B. 60°

C. 135°

D. 120°

29. A car travels 240 km on 20 L of fuel. What is its fuel efficiency in kilometres per litre?

A. 8 km/L

B. 20 km/L

C. 12 km/L

D. 15 km/L

30. The perimeter of a square is given by $P = 4s$. If $P = 36$ cm, what is the side length s ?

A. 9 cm

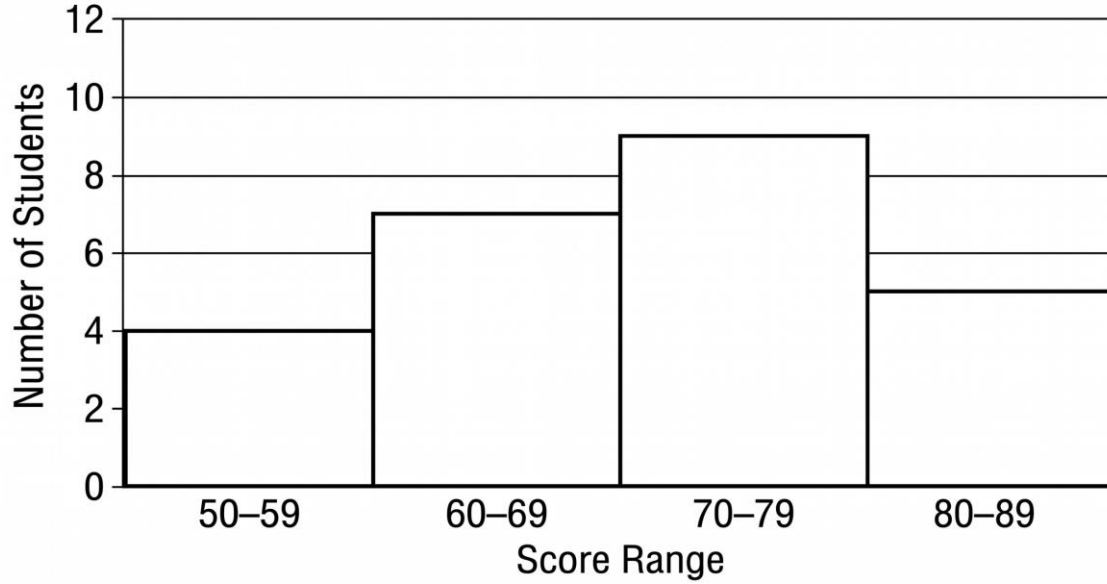
B. 6 cm

C. 144 cm

D. 18 cm

31. Look at the histogram below showing test scores. How many students scored 70 or higher?

Test Score Distribution



- A. 9
- B. 5
- C. 21
- D. 14

32. Solve for x in the equation $x^2 - 9 = 0$.

- A. $x = 9$ only
- B. $x = 3$ or $x = -3$
- C. $x = 3$ only
- D. $x = 0$ or $x = 9$

33. Evaluate the expression $2^3 + (1/2) \times 6 - 4$.

- A. 10
- B. 5
- C. 11
- D. 7

34. An arithmetic sequence has a first term of 5 and a common difference of 4. What is the 10th term?

- A. 41
- B. 45
- C. 36
- D. 49

35. A cube has an edge length of 5 cm. What is its total surface area?

- A. 25 cm^2
- B. 125 cm^2
- C. 150 cm^2
- D. 100 cm^2

36. Which measure of central tendency would change the most if the largest value in a data set were doubled?

- A. The mode
- B. The mean

- C. The median
- D. The minimum value

37. Solve for x in the equation $x/3 + x/6 = 9$.

- A. 12
- B. 15
- C. 18
- D. 6

38. A worker earns \$18 per hour for the first 40 hours and time-and-a-half (\$27 per hour) for any hours beyond that. What are the total earnings for a 46-hour week?

- A. \$828
- B. \$720
- C. \$1,242
- D. \$882

39. Which of the following is an irrational number?

- A. $\sqrt{16}$
- B. $\sqrt{20}$
- C. 0.75
- D. $3/8$

40. Five less than twice a number is 17. What is the number?

A. 11

B. 6

C. 9

D. 12

41. A data set is 12, 18, 7, 25, 14, 9. What is the range of the data set?

A. 18

B. 25

C. 14.2

D. 16

42. Expand and simplify the product $(2x - 3)(2x + 3)$.

A. $4x^2 + 9$

B. $4x^2 - 12x - 9$

C. $4x^2 - 9$

D. $2x^2 - 9$

43. A rectangular pool is 10 m long, 4 m wide, and 2 m deep. How many cubic metres of water does it hold when full?

- A. 16 m^3
- B. 40 m^3
- C. 160 m^3
- D. 80 m^3

44. After a 20% discount, a jacket costs \$64. What was the original price?

- A. \$76.80
- B. \$80
- C. \$84
- D. \$128

45. The relation $y = (x - 2)^2 + 3$ is a parabola. What are the coordinates of its vertex?

- A. $(-2, 3)$
- B. $(2, 3)$
- C. $(2, -3)$
- D. $(3, 2)$

46. A poll on a national issue is conducted by surveying visitors to one city's shopping mall on a weekday afternoon. Why might the sample be biased?

- A. It may not represent other regions or schedules
- B. The sample was chosen completely at random

- C. Too many people were surveyed for accuracy
- D. The poll asked about a national topic

47. A family's monthly budget allocates 35% to housing, 25% to food, 15% to transport, and the rest to savings. If the income is \$5,000, how much goes to savings?

- A. \$750
- B. \$1,750
- C. \$1,250
- D. \$1,500

48. Three angles of a quadrilateral measure 90° , 85° , and 95° . What is the measure of the fourth angle?

- A. 80°
- B. 100°
- C. 95°
- D. 90°

49. A \$1,200 laptop is offered with either a 15% discount or a \$200 rebate. Which is the better deal, and by how much?

- A. the discount, by \$20
- B. the rebate, by \$20
- C. the rebate, by \$180

D. they are equal in value

50. Evaluate the expression $(4.5 + 1.5) \div 0.5 - 2 \times 3$.

A. 18

B. 9

C. 0

D. 6

Practice Exam 9: Answer Key and Full Explanations

1. B — Distribute first: $3(2x - 5) = 6x - 15$, so the equation is $6x - 15 + 4 = 25$, or $6x - 11 = 25$. Adding 11 and dividing by 6 gives $x = 6$. Expanding the bracket before collecting terms keeps the steps clear.

2. A — The power-of-a-power rule multiplies the exponents: $(a^2)^5 = a^{2 \times 5} = a^{10}$. Raising a power to a power multiplies, while multiplying like bases would add.

3. D — Rearrange the triangle area formula $A = (1/2)bh$ to solve for height. Substituting $48 = (1/2)(12)h = 6h$ gives $h = 8$ cm. The base and the one-half factor combine to 6 before dividing.

4. C — The mean is the sum of values divided by their count: $(80 + 75 + 90 + 85 + 70) \div 5 = 400 \div 5 = 80$. Adding all scores before dividing gives the average.

5. A — Cross-multiply: $5(x + 2) = 3(2x - 1)$, which expands to $5x + 10 = 6x - 3$. Subtracting $5x$ and adding 3 gives $x = 13$. Cross-multiplication clears both denominators at once.

6. C — Apply the simple interest formula $I = Prt$: $4,000 \times 0.035 \times 2 = \280 . Each factor — principal, rate, and time — multiplies directly, with no compounding.

7. B — Substitute $x = -3$ carefully: $2(-3)^2 - 5(-3) + 1 = 2(9) + 15 + 1 = 18 + 15 + 1 = 34$. The square of the negative is positive, and subtracting a negative adds.

8. D — Multiply the coefficients and add the exponents: $3 \times 2 = 6$ and $10^4 \times 10^3 = 10^7$, giving 6×10^7 . Multiplying powers of ten adds the exponents.

9. C — The hypotenuse is found with the Pythagorean theorem: $\sqrt{(8^2 + 15^2)} = \sqrt{(64 + 225)} = \sqrt{289} = 17$ cm. This is the 8-15-17 right-triangle relationship.

- 10. D** — The slope from (0, 4) to (2, 10) is $(10 - 4)/(2 - 0) = 3$, and the given y-intercept is 4. The equation is therefore $y = 3x + 4$. The y-intercept supplies b directly.
- 11. A** — A deck has 13 hearts out of 52 cards, so the probability is $13/52$, which simplifies to $1/4$. One of the four suits is hearts, giving a one-in-four chance.
- 12. B** — The greatest common factor of $15x^3$ and $10x^2$ is $5x^2$. Dividing each term by $5x^2$ gives $5x^2(3x - 2)$. Factoring out the highest common power of x and the largest numerical factor yields the complete factorisation.
- 13. D** — Convert to a common denominator: $2\frac{1}{2} = 10/4$ and $3/4$ stays as $3/4$. Subtracting: $10/4 - 3/4 = 7/4 = 1\frac{3}{4}$. Mixed numbers must share a denominator before subtracting.
- 14. B** — Subtract $2x$ from both sides: $x - 7 \leq 1$. Adding 7 gives $x \leq 8$. Since no multiplication or division by a negative occurs, the inequality direction stays the same.
- 15. C** — Volume of a rectangular box is length \times width \times height: $8 \times 5 \times 3 = 120 \text{ cm}^3$. All three dimensions multiply together.
- 16. A** — A 35% markup means the selling price is 135% of cost: $40 \times 1.35 = \$54$. Multiplying by 1 plus the markup rate adds the profit in one step.
- 17. B** — Expand the square as $(x + 4)(x + 4)$: $x^2 + 4x + 4x + 16 = x^2 + 8x + 16$. A binomial squared produces a middle term equal to twice the product of the two terms.
- 18. C** — The points lie very close to a steeply rising line, so as practice hours increase, skill scores increase. The tight clustering and upward direction together indicate a strong positive correlation.
- 19. D** — Absolute value gives the distance from zero, always non-negative: $|-7| = 7$, $|3| = 3$, $|-2| = 2$. Then $7 + 3 - 2 = 8$. The bars are evaluated before the additions and subtraction.
- 20. A** — Let the integers be n and $n + 2$. Their sum is $2n + 2 = 50$, so $n = 24$ and the larger is $n + 2 = 26$. Consecutive even integers differ by 2.
- 21. C** — Substitute into $C = 2\pi r$: $2 \times 3.14 \times 50 = 314 \text{ m}$. The circumference uses the radius doubled and multiplied by π .
- 22. A** — The rate of change is the slope: $(14 - 5)/(4 - 1) = 9/3 = 3$. The change in y over the change in x gives the constant rate.
- 23. B** — Because the marble is replaced, the two draws are independent and the probabilities multiply: $(4/10)(4/10) = 16/100 = 4/25$. Replacement keeps the probability of red the same on both draws.
- 24. D** — Find 45% of 800 by multiplying: $0.45 \times 800 = 360$ students. Converting the percent to a decimal before multiplying gives the count.

- 25. A** — Subtracting the second equation from the first eliminates x : $(3x + 2y) - (3x - y) = 16 - 4$, giving $3y = 12$, so $y = 4$. Equal x -coefficients allow elimination by subtraction.
- 26. D** — Set the plan costs equal: $30 + 0.10t = 20 + 0.20t$. Subtracting gives $10 = 0.10t$, so $t = 100$ texts. At this point the two plans charge the same total.
- 27. B** — Distribute the -3 across the bracket: $-3(2x - 5) = -6x + 15$. Adding the 4 : $4 + 15 - 6x = 19 - 6x$. The negative multiplier flips the sign of both interior terms.
- 28. C** — Angles on a straight line sum to 180° . Letting the smaller be x and the larger $3x$: $x + 3x = 180$, so $4x = 180$ and $x = 45$. The larger angle is $3 \times 45 = 135^\circ$.
- 29. C** — Fuel efficiency is distance divided by fuel used: $240 \text{ km} \div 20 \text{ L} = 12 \text{ km/L}$. The unit rate expresses kilometres per single litre.
- 30. A** — Rearrange $P = 4s$ to solve for the side: $s = 36 \div 4 = 9 \text{ cm}$. A square's four equal sides mean the perimeter is divided by 4 .
- 31. D** — Scores of 70 or higher fall in the $70\text{--}79$ bar (9 students) and the $80\text{--}89$ bar (5 students). Adding the two heights: $9 + 5 = 14$ students. Histogram frequencies can be summed across intervals.
- 32. B** — Factor the difference of squares: $x^2 - 9 = (x - 3)(x + 3) = 0$. Setting each factor to zero gives $x = 3$ or $x = -3$. Both square roots satisfy the equation.
- 33. D** — Apply order of operations: $2^3 = 8$ and $(1/2) \times 6 = 3$. Then $8 + 3 - 4 = 7$. The exponent and multiplication are completed before the addition and subtraction.
- 34. A** — The n th term of an arithmetic sequence is $t_n = t_1 + (n - 1)d$. For the 10 th term: $5 + (10 - 1)(4) = 5 + 36 = 41$. The common difference is added nine times to reach the tenth term.
- 35. C** — A cube has six identical square faces, so $SA = 6s^2 = 6(5^2) = 6(25) = 150 \text{ cm}^2$. Each face area is squared before multiplying by 6 .
- 36. B** — The mean uses every value in its calculation, so doubling the largest value shifts the total and pulls the mean noticeably. The median and mode often stay fixed because they depend on position or frequency, not magnitude. The mean is the measure most sensitive to extreme values.
- 37. C** — Combine the fractions over a common denominator: $x/3 + x/6 = 2x/6 + x/6 = 3x/6 = x/2$. Setting $x/2 = 9$ gives $x = 18$. Finding the common denominator simplifies the two terms into one.
- 38. D** — Regular pay is $40 \times \$18 = \720 , and overtime is $6 \times \$27 = \162 . Total earnings are $720 + 162 = \$882$. Hours beyond 40 are paid at the higher time-and-a-half rate.
- 39. B** — An irrational number cannot be written as a fraction and has a non-terminating, non-repeating decimal. Since 20 is not a perfect square, $\sqrt{20}$ is irrational, while $\sqrt{16} = 4$, 0.75 , and $3/8$ are all rational. The non-perfect-square root is the irrational value.

- 40. A** — Translate into $2n - 5 = 17$. Adding 5 gives $2n = 22$, so $n = 11$. "Five less than twice a number" means the subtraction follows the doubling.
- 41. A** — The range is the maximum minus the minimum: $25 - 7 = 18$. The range measures the full spread, ignoring the middle values.
- 42. C** — This is a difference of squares: $(2x - 3)(2x + 3) = (2x)^2 - 3^2 = 4x^2 - 9$. The middle terms cancel because they are opposites.
- 43. D** — Volume of the rectangular pool is length \times width \times depth: $10 \times 4 \times 2 = 80 \text{ m}^3$. Full capacity equals the full volume of the rectangular space.
- 44. B** — A 20% discount means the sale price is 80% of the original: $0.80 \times \text{original} = 64$. Dividing gives $\text{original} = 64 \div 0.80 = \80 . Working backward from the sale price recovers the starting amount.
- 45. B** — In vertex form $y = (x - h)^2 + k$, the vertex is at (h, k) . Here $h = 2$ and $k = 3$, so the vertex is $(2, 3)$. The sign inside the bracket is reversed when reading off h .
- 46. A** — Surveying only mall visitors at one location and time captures a narrow slice of the population, missing people from other regions and those with different schedules. This sampling bias makes the results unrepresentative of the whole country. A national poll needs a sample drawn from across the population.
- 47. C** — Housing, food, and transport total $35\% + 25\% + 15\% = 75\%$, leaving 25% for savings. Calculating 25% of \$5,000: $0.25 \times 5,000 = \$1,250$. Finding the leftover percentage first is the efficient route.
- 48. D** — The four interior angles of a quadrilateral sum to 360° . The three given angles total $90 + 85 + 95 = 270^\circ$, so the fourth is $360 - 270 = 90^\circ$. The angle-sum property fixes the missing angle.
- 49. B** — The 15% discount saves $0.15 \times 1,200 = \$180$, while the rebate saves \$200. The rebate saves more, by $200 - 180 = \$20$. Comparing the dollar value of each offer identifies the better deal.
- 50. D** — Apply order of operations: the bracket first, $(4.5 + 1.5) = 6$, then $6 \div 0.5 = 12$ and $2 \times 3 = 6$. Finally $12 - 6 = 6$. Brackets, then division and multiplication, then subtraction.