

Kendriya Vidyalaya Class 8 Question Papers 2019

Hard Level Solved Practice Paper

Subject: Mathematics

Descriptive Examination Pattern – No MCQs

Class
VIII

Time
3 Hours

Maximum Marks
80

Level
Hard

Section A – Very Short Answer Questions

$10 \times 1 = 10$ Marks

Q1. Simplify: $-\frac{7}{12} + \frac{5}{18}$.

1 Mark

Solution:

LCM of 12 and 18 = 36.

$$-\frac{7}{12} = -\frac{21}{36}$$

$$\frac{5}{18} = \frac{10}{36}$$

Therefore,

$$-\frac{21}{36} + \frac{10}{36} = -\frac{11}{36}$$

Answer: $-\frac{11}{36}$

Q2. If $3^x = 81$, find x.

1 Mark

Solution:

$81 = 3 \times 3 \times 3 \times 3 = 3^4$ Therefore, $3^x = 3^4$ Hence, $x = 4$

Answer: $x = 4$

Q3. Find the value of $2^5 \times 2^3 \div 2^4$.

1 Mark

Solution:

Using the laws of exponents: $2^5 \times 2^3 \div 2^4 = 2^{5+3-4} = 2^4 = 16$

Answer: 16

Q4. If $4x - 9 = 19$, find x .

1 Mark

Solution:

$4x - 9 = 19$ $4x = 28$ $x = 7$

Answer: 7

Q5. Find 12.5% of 640.

1 Mark

Solution:

$12.5\% = 12.5/100 = 1/8$ Therefore, $640 \times 1/8 = 80$

Answer: 80

Q6. The sum of the interior angles of a quadrilateral is _____.

1 Mark

Solution:

The sum of the interior angles of every quadrilateral is 360° .

Answer: 360°

Q7. Find the cube root of 729.

1 Mark

Solution:

$9 \times 9 \times 9 = 729$ Therefore, $\sqrt[3]{729} = 9$

Answer: 9

Q8. If the cost price is ₹500 and selling price is ₹450, find the loss.

1 Mark

Solution:

Loss = CP - SP = $500 - 450 = ₹50$

Answer: ₹50

Q9. Find the perimeter of an equilateral triangle whose side is 13.5 cm.

1 Mark

Solution:

Perimeter = $3 \times \text{side} = 3 \times 13.5 = 40.5 \text{ cm}$

Answer: 40.5 cm

Q10. What is the multiplicative inverse of $-7/9$?

1 Mark

Solution:

The multiplicative inverse is obtained by interchanging numerator and denominator.

Therefore, Multiplicative inverse of $-7/9 = -9/7$

Answer: -9/7

Section B – Short Answer Questions

$10 \times 2 = 20$ Marks

Q11. Solve: $7x - 5 = 3x + 23$.

2 Marks

Solution:

$$7x - 5 = 3x + 23 \quad 7x - 3x = 23 + 5 \quad 4x = 28 \quad x = 7$$

Answer: $x = 7$

Q12. A number is increased by 25% and becomes 450. Find the original number.

2 Marks

Solution:

After a 25% increase: New value = 125% of original value. Let original number = x .

$$125x/100 = 450 \quad x = 450 \times 100/125 \quad x = 360$$

Answer: 360

Q13. Find the simple interest on ₹7,500 at 8% per annum for 3 years.

2 Marks

Solution:

$$SI = P \times R \times T / 100$$

$$SI = 7500 \times 8 \times 3 / 100 = ₹1800$$

Answer: ₹1,800

Q14. Simplify: $5a - 3b + 7a + 8b - 4$.

2 Marks

Solution:

Group like terms: $5a + 7a = 12a$ $-3b + 8b = 5b$ Therefore, $= 12a + 5b - 4$

Answer: $12a + 5b - 4$

Q15. The ratio of boys to girls in a class is 5:3. If there are 40 boys, find the number of girls.

2 Marks

Solution:

5 parts = 40 boys 1 part = $40/5 = 8$ Girls = 3 parts = $3 \times 8 = 24$

Answer: 24 girls

Q16. Find the area of a trapezium whose parallel sides are 18 cm and 12 cm and height is 9 cm.

2 Marks

Solution:

Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

$= \frac{1}{2} \times (18 + 12) \times 9 = \frac{1}{2} \times 30 \times 9 = 135 \text{ cm}^2$

Answer: 135 cm^2

Q17. A shopkeeper gives a discount of 15% on an article marked ₹2,400. Find the selling price.

2 Marks

Solution:

Discount: $= \frac{15}{100} \times 2400 = ₹360$ Selling price: $= 2400 - 360 = ₹2040$

Answer: ₹2,040

Q18. Find the square root of 1764 using prime factorisation.

2 Marks

Solution:

$1764 = 2 \times 2 \times 3 \times 3 \times 7 \times 7$ Pairing equal factors: $\sqrt{1764} = 2 \times 3 \times 7 = 42$

Answer: 42

Q19. A car covers 270 km in 4.5 hours. Find its average speed.

2 Marks

Solution:

Speed = Distance / Time = $270/4.5 = 60$ km/h

Answer: 60 km/h

Q20. Find three consecutive odd numbers whose sum is 75.

2 Marks

Solution:

Let the numbers be: $x, x + 2, x + 4$ Their sum: $x + x + 2 + x + 4 = 75$
 $3x + 6 = 75$
 $3x = 69$
 $x = 23$ Numbers: 23, 25 and 27

Answer: 23, 25 and 27

Section C – Application Based Questions

$10 \times 3 = 30$ Marks

Q21. Solve: $4(2x - 3) - 3(x + 5) = 20$.

3 Marks

Solution:

$$4(2x - 3) - 3(x + 5) = 20 \quad 8x - 12 - 3x - 15 = 20 \quad 5x - 27 = 20 \quad 5x = 47 \quad x = 47/5$$

Answer: $x = 47/5$

Q22. A school purchased 18 notebooks at ₹45 each and 12 registers at ₹65 each. Find the total expenditure. If the school had ₹2,000, how much money remained? 3 Marks

Solution:

Cost of notebooks: $18 \times 45 = ₹810$ Cost of registers: $12 \times 65 = ₹780$ Total expenditure:
 $810 + 780 = ₹1590$ Money remaining: $2000 - 1590 = ₹410$

Answer: Total expenditure = ₹1,590; Remaining = ₹410

Q23. A rectangular garden is 32 m long and 18 m wide. A path of width 2 m is constructed inside it along all four sides. Find the area of the path. 3 Marks

Solution:

Original area: $32 \times 18 = 576 \text{ m}^2$ Since the path is 2 m wide on each side: New length =
 $32 - 4 = 28 \text{ m}$ New breadth = $18 - 4 = 14 \text{ m}$ Area inside path: $28 \times 14 = 392 \text{ m}^2$ Area of
path: $576 - 392 = 184 \text{ m}^2$

Answer: 184 m^2

Q24. The population of a town is 48,000. It increases by 12.5% in one year. Find the new population. 3 Marks

Solution:

Increase: $12.5\% = 1/8$ Increase = $48,000 \div 8 = 6,000$ New population: $48,000 + 6,000 = 54,000$

Answer: 54,000

Q25. Find the value of $(3x + 2)(x - 4)$ and simplify the result.

3 Marks

Solution:

$$(3x + 2)(x - 4) = 3x \times x + 3x \times (-4) + 2 \times x + 2 \times (-4) = 3x^2 - 12x + 2x - 8 = 3x^2 - 10x - 8$$

Answer: $3x^2 - 10x - 8$

Q26. A sum of ₹8,000 is invested at 10% compound interest per annum for 2 years. Find the amount and compound interest.

3 Marks

Solution:

Principal = ₹8,000 Rate = 10% After first year: $8000 + 800 = ₹8,800$ After second year: $8800 + 880 = ₹9,680$ Compound Interest: $9680 - 8000 = ₹1,680$

Answer: Amount = ₹9,680; Compound Interest = ₹1,680

Q27. The angles of a quadrilateral are in the ratio 2:3:4:6. Find all four angles.

3 Marks

Solution:

Sum of angles of quadrilateral = 360° Total ratio: $2 + 3 + 4 + 6 = 15$ One part: $360/15 = 24^\circ$ Therefore: First angle = $2 \times 24 = 48^\circ$ Second angle = $3 \times 24 = 72^\circ$ Third angle = $4 \times 24 = 96^\circ$ Fourth angle = $6 \times 24 = 144^\circ$

Answer: $48^\circ, 72^\circ, 96^\circ, 144^\circ$

Q28. A cuboid has dimensions 15 cm × 8 cm × 6 cm. Find its volume and total surface area. 3 Marks

Solution:

Volume: = $15 \times 8 \times 6 = 720 \text{ cm}^3$ Total surface area: = $2(lb + bh + hl) = 2[(15 \times 8) + (8 \times 6) + (6 \times 15)] = 2(120 + 48 + 90) = 2 \times 258 = 516 \text{ cm}^2$

Answer: Volume = 720 cm³; TSA = 516 cm²

Q29. The average of five numbers is 48. Four of the numbers are 36, 51, 42 and 55. Find the fifth number. 3 Marks

Solution:

Total of five numbers: $48 \times 5 = 240$ Sum of four numbers: $36 + 51 + 42 + 55 = 184$ Fifth number: $240 - 184 = 56$

Answer: 56

Q30. A man spends 72% of his monthly income. If he saves ₹8,400 per month, find his monthly income and expenditure. 3 Marks

Solution:

Savings = $100\% - 72\% = 28\%$ Therefore, 28% of income = ₹8,400 Income: = $8400 \times 100 / 28 = ₹30,000$ Expenditure: = 72% of 30,000 = ₹21,600

Answer: Monthly Income = ₹30,000; Expenditure = ₹21,600

Section D – Long Answer Questions

$5 \times 4 = 20$ Marks

Q31. A shopkeeper marks an article at ₹4,800 and gives two successive discounts of 10% and 5%. Find the final selling price.

4 Marks

Solution:

Marked Price = ₹4,800 First discount = 10% First discount: $= 10/100 \times 4800 = ₹480$

Price after first discount: $= 4800 - 480 = ₹4,320$ Second discount = 5% Second

discount: $= 5/100 \times 4320 = ₹216$ Final selling price: $= 4320 - 216 = ₹4,104$

Answer: Final Selling Price = ₹4,104

Q32. A rectangular field has an area of 1,080 m². Its length is 12 m more than its breadth. Find its length and breadth.

4 Marks

Solution:

Let breadth = x m. Length = $x + 12$ m. Area: $x(x + 12) = 1080$ $x^2 + 12x = 1080$ We need two numbers whose product is 1080 and difference is 12. $30 \times 36 = 1080$ and $36 - 30 = 6$ So these do not satisfy the condition. Try: $27 \times 40 = 1080$ $40 - 27 = 13$ Therefore, the dimensions do not give an integer solution. Using the quadratic equation: $x^2 + 12x - 1080 = 0$ Factorisation: $(x + 36)(x - 30) = 0$ Therefore, $x = 30$ or $x = -36$ Breadth cannot be negative. Breadth = 30 m Length = $30 + 12 = 42$ m Check: $30 \times 42 = 1260$ This shows the given area is inconsistent with the stated difference.

Answer: The given data are inconsistent; no dimensions satisfy both conditions exactly.

Q33. A cylindrical tank has radius 3.5 m and height 8 m. Find its capacity in litres. Take $\pi = 22/7$.

4 Marks

Solution:

Volume of cylinder: $= \pi r^2 h = 22/7 \times 3.5 \times 3.5 \times 8$ Since $3.5 = 7/2$: $= 22/7 \times 7/2 \times 7/2 \times 8$
 $= 308 \text{ m}^3$ We know: $1 \text{ m}^3 = 1000 \text{ litres}$ Therefore: $308 \times 1000 = 308,000 \text{ litres}$

Answer: 308,000 litres

Q34. The present age of a father is three times the age of his son. After 8 years, the father's age will be twice the son's age. Find their present ages. 4 Marks

Solution:

Let son's present age = x years. Father's present age = $3x$ years. After 8 years: Son = $x + 8$ Father = $3x + 8$ According to the question: $3x + 8 = 2(x + 8)$ $3x + 8 = 2x + 16$ $3x - 2x = 16 - 8$ $x = 8$ Son's age = 8 years Father's age: $3 \times 8 = 24$ years

Answer: Son = 8 years; Father = 24 years

Q35. A student obtained 72, 84, 68, 91 and 85 marks in five subjects, each carrying 100 marks. Find the total marks, percentage and average marks. 4 Marks

Solution:

Total marks: $72 + 84 + 68 + 91 + 85 = 400$ Maximum marks: $5 \times 100 = 500$ Percentage: $= 400/500 \times 100 = 80\%$ Average: $= 400/5 = 80$

Answer: Total = 400/500, Percentage = 80%, Average = 80 marks