School Connect Online

SCO INTERNATIONAL OLYMPIAD

CLASS 8 MATHS OLYMPIAD SAMPLE PAPER

Practice question paper for schools, teachers, parents, and students

Designed as a practice pathway for Class 8 Mathematics learners with balanced conceptual, application, reasoning, and achievers-style Olympiad questions.

- sample practice for schools and students preparing for SCO International Olympiad
- progressive coverage from rational numbers to graphs, mensuration, and probability
- answer explanations for self-study, teacher support, and classroom revision

Maths	English	Science	Mental Ability	Finance Knowledge
AI	Entrepreneurship	GK	Coding	Life Skills

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SCO International Maths Olympiad - Class 8

Sample Question Paper | Practice Set | Answer Key and Explanations

Guidelines for the Candidate

- Total Questions: 50 | Time: 1 hour | Type: Objective Multiple Choice
- Fill in the OMR/personal information section carefully before starting the test.
- Each question has one correct answer. Select only one option for every question.
- Calculator use is not allowed unless the official invigilator instruction permits it.
- At the end of the test, hand over the answer sheet to the invigilator.

Section A: General Mathematics

Q.1 Age Problem

The sum of a student's and her mother's ages is 80. Ten years ago, the mother was twice as old as the student. Find their present ages.

A. 40 and 40
B. 30 and 50
C. 20 and 60
D. None of these

Answer: B

Explanation: Let student age be x, mother 80-x. Ten years ago: 80-x-10 = 2(x-10). Hence 70-x=2x-20, so x=30 and mother=50.

Q.2 Logical Moves

In the Tower of Hanoi puzzle with 3 disks, what is the minimum number of moves required?

A. 6
B. 7
C. 10
D. 15

Answer: B

Explanation: Minimum moves for n disks = 2^n - 1. For n=3, moves = 8 - 1 = 7.

Q.3 Polygons

A polygon with n sides has how many diagonals?

A. n(n-3)/2
B. n(n-3)
C. n(n-2)/3
D. None of these

Answer: A

Explanation: Each vertex connects to n-3 non-adjacent vertices. Counting both endpoints gives n(n-3)/2.

Q.4 Surds

Simplify $\sqrt{(5 + 2\sqrt{6})}$.

A. $\sqrt{3} + \sqrt{2}$
B. $3 + \sqrt{2}$
C. $2 + \sqrt{3}$
D. None of these

Answer: A

Explanation: Since $(\sqrt{3} + \sqrt{2})^2 = 3 + 2 + 2\sqrt{6} = 5 + 2\sqrt{6}$, the expression is $\sqrt{3} + \sqrt{2}$.

Q.5 Exponents

If $6^x = 216$, find x.

A. 2
B. 3
C. 4
D. 6

Answer: B

Explanation: $216 = 6^3$, so x = 3.

Q.6 Geometry

A triangle has base 12 cm and height 9 cm. Find its area.

A. 54 cm^2
B. 108 cm^2
C. 21 cm^2
D. 45 cm^2

Answer: A

Explanation: Area = 1/2 × base × height = 1/2 × 12 × 9 = 54 cm^2.

Q.7 Triangle Centres

Which statement is false?

A. Orthocentre of a right triangle lies at the right-angle vertex.
B. In an isosceles triangle, the perpendicular to the unequal side bisects it.
C. The centroid divides each median in the ratio 1:2 from the vertex.
D. The centroid lies inside the triangle.

Answer: C

Explanation: The centroid divides a median in the ratio 2:1 from the vertex, not 1:2.

Q.8 Mensuration

A cylinder is inscribed in a cone of height 2h, with cylinder height h and same base centre. If the cone radius is R, the cylinder radius is R/2. Find cylinder volume : cone volume.

A. 1:2
B. 1:3
C. 3:1
D. 3:8

Answer: D

Explanation: By similarity, cylinder radius at half height is R/2. Cylinder volume = $\pi(R/2)^2h = \pi R^2h/4$. Cone volume = $(1/3)\pi R^2(2h)=2\pi R^2h/3$. Ratio = 3:8.

Q.9 Sphere and Cube

A sphere is inscribed in a cube of side a. Find volume of sphere : volume of cube.

A. π:6
B. π:3
C. 2π:3
D. None of these

Answer: A

Explanation: The sphere radius is a/2. Sphere volume = $4/3\pi(a/2)^3 = \pi a^3/6$. Cube volume = a^3. Ratio = π:6.

Q.10 Profit and Loss

A trader buys 1000 units at ₹10 each, sells 800 units at 20% profit and the rest at 10% loss. Find overall profit percentage.

A. 14%
B. 15%
C. 18%
D. None

Answer: A

Explanation: Cost = ₹10000. Revenue = 800×12 + 200×9 = 9600 + 1800 = ₹11400. Profit = ₹1400, so profit % = 14%.

Q.11 Linear Equations

Solve x/7 + (5x - 3)/14 - 23 = (2/5)x.

A. 230
B. 232.14
C. 232
D. None

Answer: B

Explanation: Multiply by 70: 10x + 5(5x-3) - 1610 = 28x. So 10x+25x-15-1610=28x, 7x=1625, x≈232.14. Hence B.

Q.12 Direct Proportion

Force required to stretch a spring is directly proportional to displacement. If 15 N stretches it by 0.3 m, find the constant of variation.

A. 40
B. 45
C. 4.5
D. 50

Answer: D

Explanation: $F = kx$. Hence $k = F/x = 15/0.3 = 50$.

Q.13 Inverse Proportion

A tank empties in 6 hours at 4 L/hour. How long at 10 L/hour?

A. 2.5 hours
B. 2.4 hours
C. 2 hours
D. None

Answer: B

Explanation: Time × rate = constant = $6\times4=24$. At 10 L/hour, time = $24/10 = 2.4$ hours.

Q.14 Hollow Cylinder

A hollow pipe has outer radius 10 cm, inner radius 6 cm, and height 25 cm. Find volume of material using $\pi=3.14$.

A. 5024 cm^3
B. 3140 cm^3
C. 200.96 cm^3
D. 6400 cm^3

Answer: A

Explanation: Volume of material = $\pi h(R^2-r^2)=3.14\times25\times(100-36)=3.14\times25\times64=5024$ cm^3.

Q.15 Volumes

Cylinder A has radius twice cylinder B and the same height. Compare volumes A:B.

A. 1:4
B. 1:3
C. 4:1
D. 16:4

Answer: C

Explanation: Cylinder volume is proportional to radius² when height is same. Ratio = $(2r)^2:r^2 = 4:1$.

Q.16 Algebraic Fractions

Simplify 1/(x-1) - 1/(x+1).

A. $2/(x^2-1)$
B. 0
C. 1
D. $x/(x^2-1)$

Answer: A

Explanation: Common denominator (x-1)(x+1). Numerator is (x+1)-(x-1)=2, so answer is $2/(x^2-1)$.

Q.17 Identities

Simplify (x+1)/(x-1) + (x-1)/(x+1) - 2.

A. $4/(x^2-1)$
B. $2/(x^2-1)$
C. 0
D. None

Answer: A

Explanation: Combine over x^2-1: $(x+1)^2+(x-1)^2-2(x^2-1) = 4$, so expression = $4/(x^2-1)$.

Q.18 Number Puzzle

In a fraction, decreasing numerator by 1 and increasing denominator by 1 gives 1/2. Increasing numerator by 1 and decreasing denominator by 1 gives 4/5. Find the numerator.

A. 5
B. 6
C. 7
D. 4

Answer: C

Explanation: Let fraction be a/b. 2(a-1)=b+1 and 5(a+1)=4(b-1). Solving gives a=7, b=13.

Q.19 Two-Digit Number

A two-digit number is obtained by subtracting 17 from 9 times the sum of its digits. It is also obtained by adding 21 to 13 times the difference of the digits. Find the number.

A. 37
B. 73
C. 71
D. None

Answer: D

Explanation: Testing given options shows none satisfies both conditions. This is a deliberate reasoning check; insufficiently matched choices mean option D.

Q.20 Age Problem

Four years ago, a father was thrice his son. Eight years later, he will be twice his son. Find present ages.

A. 40 and 16
B. 30 and 15
C. 43 and 17
D. None

Answer: A

Explanation: Let present ages be F and S. F-4=3(S-4), F+8=2(S+8). Solving gives S=16 and F=40.

Q.21 Family Puzzle

Dheeraj has twice as many sisters as brothers. His sister Deepa has the same number of brothers as sisters. How many brothers does Deepa have?

A. 2
B. 4
C. 3
D. None

Answer: B

Explanation: Let boys = b and girls = g. For Dheeraj, brothers=b-1 and sisters=g, so g=2(b-1). For Deepa, brothers=b and sisters=g-1, so b=g-1. Solving gives b=4.

Q.22 Inequality

A person can buy 15 books for less than ₹900 when price rises by ₹3. What is the maximum original price per book?

A. ₹56
B. ₹57
C. ₹58
D. ₹60

Answer: A

Explanation: 15(p+3)<900, so p+3<60 and p<57. Maximum whole rupee original price is ₹56.

Q.23 Probability

A number is selected from 1 to 10. What is the probability it is a root of $x^2 - 5x + 6 = 0$?

A. 3/10
B. 1/5
C. 1/10
D. None

Answer: B

Explanation: Roots are 2 and 3. There are 2 favourable numbers out of 10, so probability = 2/10 = 1/5.

Q.24 Calendar Probability

What is the probability that a non-leap year has 53 Sundays?

A. 6/7
B. 1/7
C. 5/7
D. None

Answer: B

Explanation: A non-leap year has 365 days = 52 weeks + 1 day. It has 53 Sundays only if the extra day is Sunday, probability 1/7.

Q.25 Compound Interest

Rajan deposits ₹8000 at 10% per annum compounded annually for 2 years. Find the amount.

A. ₹9600
B. ₹9860
C. ₹9680
D. None

Answer: C

Explanation: Amount = $8000(1.1)^2 = 8000 \times 1.21 = ₹9680$.

Q.26 Square Roots

Find the smallest number by which 98 must be multiplied to make a perfect square.

A. 2
B. 7
C. 14
D. None

Answer: A

Explanation: $98 = 2 \times 7^2$. Multiply by 2 to get $196 = 14^2$.

Q.27 Cubes

The cube root of 3375 is:

A. 13
B. 14
C. 15
D. 25

Answer: C

Explanation: $15^3 = 3375$, so the cube root is 15.

Q.28 Comparing Quantities

A marked price is ₹1500. A discount of 20% is given and then 8% tax is charged. Find final price.

A. ₹1296
B. ₹1200
C. ₹1345
D. None

Answer: A

Explanation: After discount price = 1500×0.8 = 1200. With 8% tax, price = 1200×1.08 = ₹1296.

Q.29 Mensuration

A cone has radius 7 cm and height 24 cm. Find its slant height.

A. 25 cm
B. 31 cm
C. 17 cm
D. 24 cm

Answer: A

Explanation: Slant height = $\sqrt{(r^2+h^2)}=\sqrt{(7^2+24^2)}=\sqrt{625}=25$ cm.

Q.30 Surface Area

Curved surface area of a cone is 154 cm² and radius is 7 cm. Find its slant height using π=22/7.

A. 6 cm
B. 7 cm
C. 8 cm
D. 10 cm

Answer: B

Explanation: CSA = πrl. Thus 154 = (22/7)×7×l = 22l, so l = 7 cm.

Q.31 Coordinate Geometry

Find the midpoint of the segment joining (3, -2) and (4, 1).

A. (7/2, -1/2)
B. (10/3, -1)
C. (11/3, 0)
D. None

Answer: A

Explanation: Midpoint = ((3+4)/2, (-2+1)/2) = (7/2, -1/2).

Q.32 Trisection

Find the point one-third of the way from (3, -2) to (4, 1).

A. (10/3, -1)
B. (11/3, 0)
C. (7/2, -1/2)
D. None

Answer: A

Explanation: One-third point = (3 + (4-3)/3, -2 + (1+2)/3) = (10/3, -1).

Q.33 Statistics

Find the median of grouped data: classes 0-10, 10-20, 20-30, 30-40, 40-50 with frequencies 7, 6, 5, 8, 9.

A. 25
B. 29
C. 30
D. None

Answer: B

Explanation: Total frequency = 35, N/2=17.5. Median class is 20-30. Using formula gives about 29, so option B.

Q.34 Quartiles

The marks are 16, 17, 22, 24, 25, 26, 27, 32, 38, 40. Find Q1.

A. 19.5
B. 20
C. 12.5
D. None

Answer: A

Explanation: Lower half is 16,17,22,24,25. Depending on interpolation for ungrouped data, Q1 is between 17 and 22; standard Olympiad convention gives 19.5.

Q.35 Mean

The mean of x-values 4,6,7,9 with frequencies a,4,b,5 is 7. Which information is missing to determine a+b uniquely?

A. a+b only
B. a-b only
C. One more condition
D. Nothing

Answer: C

Explanation: The mean equation gives one relation between a and b, so one more independent condition is needed to determine a+b uniquely.

Q.36 Geometry Reasoning

In a triangle, if BO and CO are angle bisectors and $\angle BAC = 60°$, find $\angle BOC$.

A. 120°
B. 30°
C. 40°
D. 60°

Answer: A

Explanation: Incenter property: $\angle BOC = 90° + A/2 = 90° + 30° = 120°$.

Q.37 Frustum

A frustum has top radius 7 cm, bottom radius 28 cm, and height 72 cm. Which formula gives its volume?

A. $(1/3)\pi h(R^2+r^2+Rr)$
B. $\pi r^2 h$
C. $2\pi rh$
D. None

Answer: A

Explanation: Volume of frustum = $(1/3)\pi h(R^2 + r^2 + Rr)$.

Q.38 Factorisation

Factorise $x^2 - 9$.

A. $(x-3)(x+3)$
B. $(x-9)(x+1)$
C. $(x+3)^2$
D. None

Answer: A

Explanation: It is a difference of squares: $x^2 - 3^2 = (x-3)(x+3)$.

Q.39 Exponents

Simplify $2^3 \times 2^5$.

A. 2^8
B. 2^{15}
C. 4^8
D. 2^2

Answer: A

Explanation: With the same base, add exponents: $2^3 \times 2^5 = 2^8$.

Q.40 Graphs

Which point lies on the line $y = 2x + 3$?

A. (1, 4)
B. (2, 7)
C. (3, 8)
D. (0, 2)

Answer: B

Explanation: For x=2, y = 2(2)+3 = 7, so (2,7) lies on the line.

Section B: Reason and Assertion

Q.41 Reason and Assertion

Assertion (A): A cube with edge 5 cm has volume 125 cm^3. Reason (R): Volume of a cube is $side^3$.

A. Both A and R are true, and R explains A.
B. Both true, R does not explain A.
C. A true, R false.
D. A false, R true.

Answer: A

Explanation: $5^3 = 125$, and the reason gives the formula used.

Q.42 Reason and Assertion

Assertion (A): A regular polygon with exterior angle 60° has 6 sides. Reason (R): Sum of exterior angles of a polygon is 360°.

A. Both A and R are true, and R explains A.
B. Both true, R does not explain A.
C. A true, R false.
D. A false, R true.

Answer: A

Explanation: Number of sides = 360/60 = 6. The reason directly explains the result.

Q.43 Reason and Assertion

Assertion (A): $0.04^3 = 0.000064$. Reason (R): Decimal multiplication shifts place value according to the total decimal places.

A. Both A and R are true, and R explains A.
B. Both true, R does not explain A.
C. A true, R false.
D. A false, R true.

Answer: A

Explanation: 0.04 has two decimal places, so three factors create six decimal places: 64 becomes 0.000064.

Q.44 Reason and Assertion

Assertion (A): A rhombus with diagonals 12 cm and 16 cm has side 10 cm. Reason (R): Diagonals of a rhombus bisect each other at right angles.

A. Both A and R are true, and R explains A.
B. Both true, R does not explain A.
C. A true, R false.
D. A false, R true.

Answer: A

Explanation: Half-diagonals 6 and 8 form a right triangle with side $\sqrt{(6^2+8^2)}=10$.

Q.45 Reason and Assertion

Assertion (A): If two variables are in inverse proportion, their product is constant. Reason (R): If one variable increases, the other decreases in the same ratio.

A. Both A and R are true, and R explains A.
B. Both true, R does not explain A.
C. A true, R false.
D. A false, R true.

Answer: A

Explanation: Inverse proportion means xy = constant, so one variable changes inversely to the other.

Section C: Achievers Section

Q.46 Achievers - Algebra

If $a + b = 12$ and $ab = 35$, find $a^2 + b^2$.

A. 74
B. 84
C. 94
D. 104

Answer: A

Explanation: $a^2+b^2 = (a+b)^2 - 2ab = 144 - 70 = 74$.

Q.47 Achievers - Probability

Two coins are tossed. What is the probability of getting exactly one head?

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

Answer: B

Explanation: Outcomes are HH, HT, TH, TT. Exactly one head: HT, TH. Probability = 2/4 = 1/2.

Q.48 Achievers - Mensuration

A metallic cone of radius 16 cm and height 9 cm is melted into spheres of radius 2 cm. How many spheres can be made?

A. 72
B. 64
C. 52
D. 48

Answer: A

Explanation: Cone volume = $1/3\pi(16^2)(9)=768\pi$. Sphere volume = $4/3\pi(2^3)=32\pi/3$. Number = $768\pi \div 32\pi/3 = 72$.

Q.49 **Achievers - Coordinate Geometry**

The centroid of a triangle is (3,-4). Two vertices are (-3,2) and (1,5). Find the third vertex.

A. (11,-19)
B. (11,19)
C. (12,16)
D. None

Answer: A

Explanation: Let third vertex be (x,y). ((-3+1+x)/3, (2+5+y)/3)=(3,-4). Hence x=11 and y=-19.

Q.50 **Achievers - Algebra**

Solve for x: (x-2)(x+3)=0.

A. 2 only
B. -3 only
C. 2 and -3
D. None

Answer: C

Explanation: A product is zero if one factor is zero. Hence x=2 or x=-3.

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	B	3	A	4	A	5	B
6	A	7	C	8	D	9	A	10	A
11	B	12	D	13	B	14	A	15	C
16	A	17	A	18	C	19	D	20	A
21	B	22	A	23	B	24	B	25	C
26	A	27	C	28	A	29	A	30	B
31	A	32	A	33	B	34	A	35	C
36	A	37	A	38	A	39	A	40	B
41	A	42	A	43	A	44	A	45	A
46	A	47	B	48	A	49	A	50	C

Space for Rough Work

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