

SYLLABUS OF MATHEMATICS OLYMPIAD**Number Sense** : Back and Forth Counting, Ones and Tens**Computation Operations** : Addition, Subtraction, Comparison**Patterns** : Patterns**Money, Time and Calendar** : Money, Time and Calendar**Length, Weight and Comparison** : Measurement**Geometrical Shapes** : Identification of Geometrical Figures**Reasoning and Aptitude** : Mental Aptitude

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1. Which of the following numbers is the largest?
(A) 5 (B) 8
(C) 3 (D) 11

 2. Which of the following shapes has four sides?
(A) circle (B) triangle
(C) square (D) hexagon

 3. Which of the following numbers is odd ?
(A) 4 (B) 6
(C) 8 (D) 9

 4. $6 \text{ tens} + 5 \text{ tens} + 14 \text{ ones} = \underline{\hspace{2cm}}$
(A) 114 (B) 1114
(C) 124 (D) None of these

 5. Which of the following numbers is divisible by both 2 and 3 ?
(A) 6 (B) 8
(C) 10 (D) 15

 6. How many sides does a hexagon have ?
(A) 3 (B) 4
(C) 5 (D) 6

 7. How many hours are in a day ?
(A) 12 (B) 24
(C) 36 (D) 48

 8. Which of the following numbers is a multiple of both 4 and 5 ?
(A) 12 (B) 15
(C) 20 (D) 25

 9. $8 + 6 + 8 - 3 = ?$
(A) 19 (B) 10
(C) 14 (D) 13

 10. Which of the following numbers is the smallest ?
(A) -5 (B) -3
(C) 0 (D) 2
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SPACE FOR ROUGH WORK

ANSWERS

(1) D (2) C (3) D (4) C (5) D (6) D (7) B (8) C (9) A (10) A

SYLLABUS OF MATHEMATICS OLYMPIAD

Number Sense : Ones, Tens and Hundreds

Computation Operations : Addition, Subtraction, Multiplication, Division, Comparison

Patterns : Patterns

Money, Time and Calendar : Money, Time and Calendar

Length, Weight and Comparison : Measurement

Geometrical Shapes : Geometrical Figures

Reasoning and Aptitude : Mental Aptitude

CLASS

2

1. What is the place value of digit 9 in 569873 ?

- (A) 9873 (B) 900
(C) 9000 (D) 90

2. Add the numbers given in the box.

25
31
35

- (A) 90 (B) 94
(C) 98 (D) 91

3. Williams has 15 pens. He gives 5 pens to Steve and 6 pens to Jack. How many pens have left with him now ?

- (A) 4 (B) 9
(C) 5 (D) 8

4. Which one of the following is not correct ?

- (A) $556 > 567$ (B) $554 < 555$
(C) $598 = 598$ (D) $452 > 450$





5. Steve has 6 twenty rupees note. How much money he has?

- (A) 120 rupees (B) 100 rupees
(C) 115 rupees (D) 118 rupees



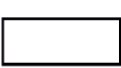

6. A travels a distance of 56 km and B travels a distance of 39 km. Who travels the longer distance and by how much ?

- (A) A by 17 km (B) A by 19 km
(C) B by 19 km (D) A by 20 km





7. Which one of the following options has horizontal lines ?

- (A)  (B) 
(C)  (D) 

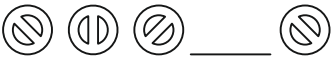



8. Which one of the following is not a rectangle?

- (A)  (B) 
(C)  (D) 

9. Continue the pattern:

- 
- (A)  (B) 
(C)  (D) All the above

10. What will come in the blank on following correct order of the given figures?

- 
- (A)  (B) 
(C)  (D) All the above

SPACE FOR ROUGH WORK

ANSWERS

- (1) C (2) D (3) A (4) A (5) A (6) A (7) A (8) B (9) B (10) B

SYLLABUS OF MATHEMATICS OLYMPIAD

Numbers and Their Operations : Number Sense and Numeration, Addition and Subtraction, Multiplication and Division

Parts and Wholes : Fractions

Money, Time and Calendar : Time and Calendar, Money, Unitary Method

Length, Weight and Comparison : Measurement

Geometry : Geometrical Shapes

Pictograph and Bar Graph : Data Handling

Reasoning and Aptitude : Reasoning and Aptitude

1. There are four prime numbers between 1 and 10 and again four prime numbers between 10 and 20. How many prime numbers are there between 91 and 100 ?

(A) 1 (B) 2
(C) 3 (D) 4

2. How many hundreds are there in 7308 ?

(A) Zero (B) Three
(C) Eight (D) Seven

3. Which one of the following numbers will replace the question mark (?) in the number sentence given below ?

$$137 - 49 = 24 + ?$$

(A) 65 (B) 64
(C) 62 (D) 63

4. The remainder and the quotient in the given division are: $(341 \div 12)$

(A) 5 and 37 (B) 5 and 29
(C) 4 and 34 (D) 5 and 28

5. In which of the following figures, the fraction represented by shaded circles is equal to $\frac{1}{5}$?



6. When 3 hours 56 minutes is subtracted from 10 : 45 pm, the new time is:

(A) 6 : 39 pm (B) 6 : 49 pm
(C) 5 : 39 pm (D) 4 : 29 pm

7. What would be the total cost of 4 pens and 5 erasers? Pens: ₹ 21 each Erasers: ₹ 5 each



(A) ₹ 110 (B) ₹ 111
(C) ₹ 112 (D) ₹ 109

8. Add 65 m 38 cm and 26 m 45 cm.

(A) 91 m 83 cm (B) 98 m 13 cm
(C) 159 m 27 cm (D) 113 m 46 cm

9. How many line segments are required to make the alphabet W ?

(A) 6 (B) 4
(C) 3 (D) 5

10. Some notebooks are equally distributed among 5 students in a week as given below. If one symbol represents 2 notebooks, how many notebooks did each student get after the week ?

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

(A) 4 (B) 5
(C) 6 (D) 8

SPACE FOR ROUGH WORK

ANSWERS

(1) A (2) B (3) B (4) D (5) B (6) B (7) D (8) A (9) B (10) A

SYLLABUS OF MATHEMATICS OLYMPIAD

Numbers and Their Operations : Number Sense and Numeration, Roman numerals, Addition and Subtraction, Multiplication and Division

Parts and Wholes : Fractions and decimals

Money and Unitary Method : Money, Unitary Method

Geometry : Geometrical Shapes

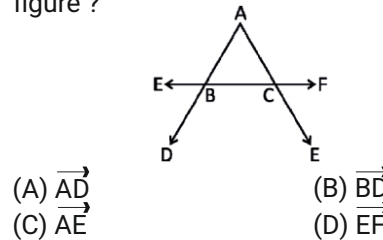
Area and Its Boundary : Perimeter and Area

Graphical Representation of Data : Data Handling

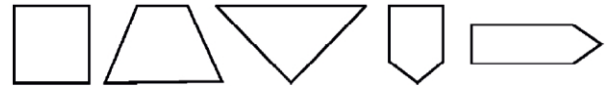
Reasoning and Aptitude : Reasoning and Aptitude

- Successor of 66998 is:
(A) 66997 (B) 66998
(C) 66999 (D) 66990
- Find the two missing numbers in the number series given below.
84, 75, 66, ?, 48, 39, ?
(A) 54, 33 (B) 57, 30
(C) 51, 37 (D) 53, 32
- Sum of place value and face value of 7 in the number 8708 is:
(A) 708 (B) 807
(C) 700 (D) 707
- The sum of two numbers is 52149. If one of them is 14732, then find the other number.
(A) 37417 (B) 39557
(C) 35527 (D) 38687
- Which one of the following is a pair of like fractions ?
(A) $\frac{3}{17}, \frac{17}{3}$ (B) $\frac{12}{8}, \frac{16}{10}$
(C) $\frac{4}{17}, \frac{14}{17}$ (D) $\frac{14}{21}, \frac{14}{22}$
- Three paise is equal to:
(A) ₹ $\frac{1}{3}$ (B) ₹ $\frac{3}{100}$
(C) ₹ $\frac{1}{300}$ (D) ₹ 3.0
- Susan's father bought 7 boxes of soda for a party. There were 28 cans in each box. How many cans of soda did her father buy altogether ?
(A) 186 (B) 196
(C) 112 (D) 206

- Which one of the following is not a ray in the given figure ?

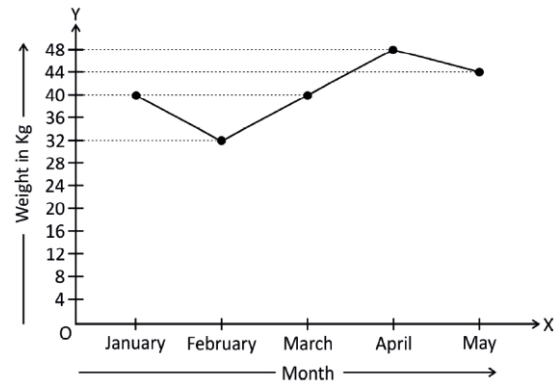


- The shapes given below are:



- (A) triangles (B) quadrilaterals
(C) polygons (D) pentagons

- Given line graph tells us about Maria's body weight in kilograms for 5 months.



In which month, Maria's body weight was the lowest ?

- (A) January (B) February
(C) April (D) May

SPACE FOR ROUGH WORK

ANSWERS

- (1) C (2) B (3) D (4) A (5) C (6) B (7) B (8) D (9) C (10) B

SYLLABUS OF MATHEMATICS OLYMPIAD

Numbers and Their Operations : Number Sense and Numeration, Numbers in Operations, Factors and Multiples

Parts and Wholes : Fractions and decimals

Percentage, Ratio and Proportion : Percentage, Ratio and Proportion/ Time and Distance





Geometry and Measurement : Measurement Geometry

Graphical Representation of Data : Data Handling

Algebra : Introduction to Algebra

CLASS

5

- Sixteen crore sixteen lakh sixteen thousand six hundred sixteen is:
(A) 16,16,16,616 (B) 1,61,61,61,616
(C) 1,61,61,61,61,616 (D) 6,16,16,616
- Roman numerals for the greatest three digit even number is:
(A) CMXCVIII (B) CMLXXXIX
(C) CMXXVIII (D) CMLXVIII
- Find the missing number.
 $2567209 + 0 + 63125 = ? + 2567209$
(A) 0 (B) 2567209
(C) 63125 (D) 2630334
- When 14th multiple of 9 is divided by 6th multiple of 21, the result is:
(A) 2 (B) 1
(C) 3 (D) 7
- What per cent of 7 litres is 70 millilitres ?
(A) 0.1% (B) 1%
(C) 10% (D) 0.01%
- Simple Interest on ₹ 600 for 6 years at 6% per annum is:
(A) ₹ 324 (B) ₹ 360
(C) ₹ 180 (D) ₹ 216
- How long does a lorry take to travel 228 km at the speed of 60 km/h ?
(A) 3 hours 12 minutes (B) 3 hours 24 minutes
(C) 3 hours 48 minutes (D) 4 hours 6 minutes
- Which one of the following clocks shows the time 15 minutes to 6 ?
(A)  (B) 
(C)  (D) 
- How many rectangular plots of land (30 m × 15 m) can be cut from a square field of side 300 m long ?
(A) 100 (B) 300
(C) 200 (D) 400
- What per cent of a rupee is 4 paise ?
(A) 8% (B) 40%
(C) 4% (D) 20%

SPACE FOR ROUGH WORK

ANSWERS

(1) A (2) A (3) C (4) B (5) B (6) D (7) C (8) B (9) C (10) C

SYLLABUS OF MATHEMATICS OLYMPIAD

Number Systems : Numbers and Their Operations Factors and Multiples

Parts and Wholes : Fractions and decimals

Algebra, Ratio and Proportion : Algebra, Ratio and Proportion

Geometry and Mensuration : Mensuration Geometry

Graphical Representation of Data : Data Handling

Sets and Their Representations : Introduction to Sets

- In 4,869,052,147 the digit 8 stands for:
(A) eight million (B) eighty million
(C) eight hundred million (D) 8 billion
- Find the sum of A, B and C in the given Magic Square where the sum of the numbers in every horizontal line, vertical line and diagonal remain same.

A	9	8
11	7	B
6	C	10

 (A) 17 (B) 11
(C) 12 (D) 14
- The integer which is 5 more than $\{(-6) + (-3)\}$ is:
(A) -3 (B) -4
(C) 5 (D) -2
- Which of the following pairs is not a pair of co-primes ?
(A) (43, 45) (B) (7, 8)
(C) (3, 5) (D) (9, 15)
- Product of the following multiplication is:
 7213.4098×1000
(A) 72.134098 (B) 721340.98
(C) 7.2134098 (D) 7213409.8
- A boy has 120 pens out of which $\frac{3}{5}$ are red pens and $\frac{7}{12}$ of red pens are gel pens. How many gel pens does the boy have ?
(A) 48 (B) 60
(C) 42 (D) 36

- A car travels for 3 hours and covers a distance at the speed of 80 km/h. If it travels at the speed of 96 km/h, then how much time will it take to cover the same distance ?
(A) 2 hours (B) $2\frac{1}{2}$ hours
(C) $2\frac{2}{3}$ hours (D) 3 hours
- The difference of 124° and 35° is a/an:
(A) obtuse angle (B) right angle
(C) acute angle (D) zero angle
- Find the cost of fencing a semicircular garden of radius 14 m, at the rate of ₹ 12 per metre (use $\pi = \frac{22}{7}$).
(A) ₹ 812 (B) ₹ 778
(C) ₹ 642 (D) ₹ 864
- The following pie chart shows the favourite games of 240 students of a school.

How many more students have Football as their favourite game than that of Volleyball ?

(A) 48 (B) 36
(C) 42 (D) 58

Game	Percentage
Football	35%
Cricket	20%
Hockey	20%
Badminton	10%
Volleyball	15%

SPACE FOR ROUGH WORK

ANSWERS

- (1) C (2) C (3) B (4) D (5) D (6) C (7) B (8) C (9) D (10) A

SYLLABUS OF MATHEMATICS OLYMPIAD

Numbers and Their Operations : Integers, Simplifying Arithmetic Expressions, Fractions and Decimals, Rational Numbers and Exponents

Algebra : Algebraic Expressions, Algebraic Identities & Linear Equations

Ratio and its Applications : Ratio and Proportion, Percentage, Profit and Loss, Simple and Compound Interests

Geometry and Mensuration : Lines and Angles, Triangles, Quadrilaterals, Solid Shapes, Perimeter, Area of Closed Figures

Data Handling : Terms related to data and Graphical representation of data, Chance and Probability

CLASS

8

1. Factorize the following expression:
 $(2a + 3b + c)^2 - 20a - 10c - 30b + 21$.
 (A) $(2a + 3b + c - 7)(2a + 3b + c - 3)$
 (B) $(2a - 3b + c + 7)(2a - 3b + c - 3)$
 (C) $(2a + 3b - c - 7)(2a + 3b + c - 7)$
 (D) $(a + 3b + c - 7)(a + 3b + c - 3)$

2. Find the solution set of
 $8m + 16 \geq -48$ and $-11m + 27 \leq -28$.
 (A) $-8 \leq m \leq 8$ (B) $-6 \leq m < 5$
 (C) $-8 \leq m \leq 5$ (D) $-6 \leq m \leq -5$

3. In a parallelogram PQRS, the bisectors of $\angle P$ and $\angle Q$ meet at M. Find $\angle PMQ$.
 (A) 45° (B) 90°
 (C) 30° (D) 60°

4. A is thrice as good as B and therefore is able to finish a work in 80 days less than B. Find the number of days required to complete the work if they are working together.
 (A) 20 days (B) 30 days
 (C) 32 days (D) 40 days

5. A cuboidal tank is made by digging earth whose length is 4 metre, breadth is 3 metre and height is 2.5 metre. Find the length of its diagonal.
 (A) 5.59 m (B) 6.2 m
 (C) 7.5 m (D) 7.12 m

6. The chart used to depict the division of a total into sub-portions is known as:
 (A) Bar graph (B) Line graph
 (C) Linear graph (D) Pie graph

7. If $x + 4/x = 4$, find the value of $x^3 + 4/x^3$.
 (A) 8 (B) 16
 (C) $8^{1/2}$ (D) $16^{1/2}$

8. Y is to the west of X and north of W. R is to the southeast of Y and to the northwest of Q, who is to the east of W. R is in which direction of W?
 (A) South (B) West
 (C) North-East (D) South-East

9. Which of the following can never be the measure of exterior angles of a regular polygon?
 (A) 20° (B) 27°
 (C) 36° (D) 72°

10. The quantity of petrol filled in a car and the cost of petrol are given in the following table. Find the cost of 24 litres of petrol using a linear graph.

Quantity of petrol (in litres)	20	30	40	50	60
Cost of petrol (in Rs.)	1000	1500	2000	2500	3000

 (A) ₹ 1000 (B) ₹ 1200
 (C) ₹ 1500 (D) ₹ 2400

SPACE FOR ROUGH WORK

ANSWERS

- | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| (1) A | (2) C | (3) B | (4) B | (5) A | (6) D | (7) B | (8) C | (9) B | (10) B |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|

SYLLABUS OF MATHEMATICS OLYMPIAD

Real Numbers : Irrational Numbers, Real numbers and their Decimal expansions, Operation on real Numbers, Laws of Exponents for real numbers

Algebra & Co-ordinate geometry : Polynomials in one variable, Zeroes of a polynomial, Factorization of Polynomials, Logarithms, Linear equation in two variables, Graph of Linear equation in two variables, Solution of Linear Equations, Co-ordinate geometry

Geometry : Lines and angles, Triangles, Quadrilaterals, Circles

Statistics and Probability : Measures of Dispersion, Mean, Median and mode, Probability of an Event

Applied Mathematics : Mensuration, Word Problems Based On Mathematics

Reasoning and Aptitude : Reasoning and Aptitude

1. If $A = \sqrt{13} - \sqrt{5}$ and $B = \sqrt{17} - \sqrt{13}$, then ____
 (A) $A > B$ (B) $A < B$
 (C) $A = B$ (D) $A < 2B$

2. $78^3 - 33^3 - 45^3$ is equal to
 (A) 347490 (B) 247280
 (C) 387490 (D) 387280

3. In a $\triangle ABC$, if $\angle A - \angle B = 35^\circ$ and $\angle C - \angle B = 34^\circ$ then
 (A) $\angle A = 71^\circ$ (B) $\angle B = 72^\circ$
 (C) $\angle A + \angle B = 109^\circ$ (D) $\angle A + \angle C = 142^\circ$

4. Let $(k - 1)$ be the mid point and 'm' be the lower class limit of a class in a continuous frequency distribution. The upper class-limit of the class is ____
 (A) $(k - 1) - m$ (B) $(k - 1) + m$
 (C) $2(k - 1) - m$ (D) $2(k + 1) - m$

5. In what proportion water be mixed with pure milk in order to make a profit of 20 % by selling it at cost price ?
 (A) 2 : 3 (B) 1 : 5
 (C) 3 : 4 (D) 4 : 3

6. Find the least value from $\sqrt[4]{2}, \sqrt[6]{3}, \sqrt[9]{5}, \sqrt[12]{7}$
 (A) $\sqrt[4]{2}$ (B) $\sqrt[6]{3}$
 (C) $\sqrt[9]{5}$ (D) $\sqrt[12]{7}$

7. The difference of the mean of first five prime numbers to the mean of first 5 multiples of 3 is ____
 (A) 9 (B) 5.6
 (C) 2.8 (D) 3.4

8. The radius of the circle, in which an equilateral triangle of side 16 cm is inscribed, is ____
 (A) $8\sqrt{3} / 3$ cm (B) $16\sqrt{3} / 3$ cm
 (C) $8\sqrt{3}$ cm (D) $2\sqrt{3} / 3$ cm

9. In a game of shooting if a person hits a target 7 times and missed it by 28 times then probability that he missed the target is ____
 (A) $1/5$ (B) $4/5$
 (C) $1/4$ (D) $2/5$

10. Arjun spends 70% of his income. If his income is increased by 30% and also his expenditure is increased by 45%, then percentage of his savings is ____.
 (A) Increased by 95% (B) Increased by 15%
 (C) Decreased by 5% (D) Decreased by 95%

SPACE FOR ROUGH WORK

ANSWERS

- | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| (1) A | (2) A | (3) C | (4) C | (5) B | (6) D | (7) D | (8) A | (9) B | (10) C |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|

SYLLABUS OF MATHEMATICS OLYMPIAD

Number System & Sequence and Series : Rational and Irrational Numbers, Arithmetic Progression

Algebra & Co-ordinate geometry : Polynomials, Pair of Linear equations in two variables, Quadratic equation, Distance Formula, Section Formula

Geometry : Similar figures, Similarity of Triangles, Circles, Tangent to a circle

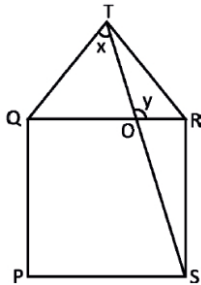
Trigonometry : Trigonometry, Height and Distance

Statistics and Probability : Mean, Mode and Median of grouped Data, Probability of Events

Mensuration : Surface Area and Volume

Reasoning and Aptitude : Reasoning and Aptitude

- The largest number that divides 588, 1999 and 1650 leaving remainders 3, 10 and 12 respectively is _____.
(A) 117 (B) 109
(C) 27 (D) 43
- A polynomial of degree n has _____.
(A) two zeroes (B) n zeroes
(C) at least n zeroes (D) at most n zeroes
- The points $(-5, 0)$, $(0, 4)$ and $(5, 1)$ are the vertices of a _____.
(A) right triangle (B) isosceles triangle
(C) equilateral triangle (D) scalene triangle
- Find the solution set of $a^2 + 21 + 8a > 0$
(A) $(-\infty, \infty)$ (B) $(4, \infty)$
(C) $(-4, \infty)$ (D) $(-4, 4)$
- In the shown figure, an equilateral triangle QRT surmounts square PQRS. Find the value of $x + y$.



- (A) 100° (B) 110°
(C) 120° (D) 150°

- If $\sin(\alpha + \beta) = 1$ then $\cos(\alpha - \beta)$ can be reduced to _____.
(A) $\sin 2\beta$ (B) $\cos 2\beta$
(C) $\sin \alpha$ (D) $\cos \beta$
- The angle of elevation of a cloud from a point 90m above a lake is 30° and the angle of depression of the reflection of cloud in the lake is 60° . Find the height of the cloud.
(A) 90 m (B) 120 m
(C) 180 m (D) 45 m
- If $x < y < 2x$ and the mean and the median of x , y and $2x$ are 18 and 15 respectively, then the value of x is _____.
(A) 10 (B) 11
(C) 12 (D) 13
- Find the missing character from among the given alternatives.

A2	C4	E6
G3	I5	?
M5	O9	Q14

(A) J15 (B) K8
(C) K15 (D) L10
- If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be $x + a$. Find the values of k and a .
(A) 5, -5 (B) -5, 5
(C) 5, -7 (D) 7, -5

SPACE FOR ROUGH WORK

ANSWERS

- (1) B (2) D (3) D (4) B (5) D (6) A (7) C (8) D (9) B (10) A

SYLLABUS OF MATHEMATICS OLYMPIAD

Sets & Functions : Sets, Relations and Functions, Trigonometric functions

Algebra : Complex number, Sequence and series, Permutation and combination, Inequality, Quadratic equation

Co-ordinate Geometry : Straight lines, Conic Sections

Calculus : Limits and derivatives

Statistics and Probability : Measures of Dispersion, Range, Mean Deviation, Variance and Standard Deviation, Analysis of frequency Distribution, probability

Reasoning and Aptitude : Reasoning and Aptitude

1. The set $(A \cup B \cup C) \cap (A \cap B' \cap C')$ is equal to _____.

- (A) $B \cap C'$ (B) $A \cap C$
(C) $B' \cap C'$ (D) $B \cap C$

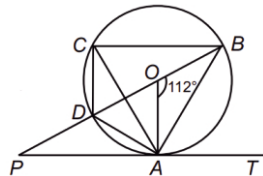
2. The value of the expression $3(\sin\theta - \cos\theta)^4 + 6(\sin\theta + \cos\theta)^2 + 4(\sin^6\theta + \cos^6\theta)$ is

- (A) 11 (B) 12
(C) 13 (D) 0

3. Let S denotes the sum of the series $1 + 8/2! + 21/3! + 40/4! + 65/5! + \dots$, then _____.

- (A) $S < 8$ (B) $S > 12$
(C) $8 < S < 12$ (D) $12 < S < 16$

4. In the given figure (not drawn to scale), a circle with centre O passes through A, B, C and D. PDOB is a straight line and PAT is a tangent to the circle. If $\angle AOB = 112^\circ$ and $AD = DC$, then find $\angle APO$ and $\angle ACB$ respectively.



- (A) $20^\circ, 60^\circ$ (B) $28^\circ, 56^\circ$
(C) $22^\circ, 56^\circ$ (D) $38^\circ, 68^\circ$

5. Let two fair six-faced dice A and B be thrown simultaneously. If E1 is the event that die A shows up four, E2 is the event that die B shows up two and E3 is the event that the sum of numbers on both dice is odd, then which one of the following statements is not true ?

- (A) E1, E2 and E3 are independent
(B) E1 and E3 are independent
(C) E2 and E3 are independent
(D) E1 and E2 are independent

6. Rajan got married 8 years ago. His present age is $6/5$ times his age at the time of his marriage. Rajan's sister was 10 years younger to him at the time of his marriage. The present age of Rajan's sister is

- (A) 32 years (B) 36 years
(C) 38 years (D) 40 years

7. $\lim_{n \rightarrow \infty} n(\sqrt{n^2+4}-n)$ is equal to _____.

- (A) e (B) 1
(C) 2 (D) e^2

8. For a positively skewed distribution, mean is always

(A) Less than the median (B) Less than the mode
(C) Greater than the mode (D) Difficult to tell

SPACE FOR ROUGH WORK

ANSWERS

- (1) A (2) C (3) C (4) C (5) A (6) C (7) C (8) C

SYLLABUS OF MATHEMATICS OLYMPIAD

Relations and Functions : Sets, Types of Relations, Types of Functions, Binary Operations, Inverse Trigonometric functions

Algebra : Matrices and Determinants

Vectors & 3D : Vector algebra and Three dimensional geometry

Calculus : Applications of Derivatives, Integrals, Definite Integrals, Application of Integrals, Differential Equation

Linear programming : Linear Programming Problem

Probability : Independent Events, Conditional Probability, Multiplication Theorem on Probability, Bayes' Theorem, Theorem of total Probability, Variables and Standard Deviation

Reasoning and Aptitude : Reasoning and Aptitude

- | | |
|--|--|
| <p>1. The set of points of discontinuity of the function $f(x) = \log(x)$ is
 (A) $\{0\}$ (B) $\{1, -1\}$
 (C) $\{-\infty, \infty\}$ (D) None of these</p> <hr/> <p>2. The function $f(x) = 1/x$ on its domain is:
 (A) Increasing function (B) Decreasing function
 (C) Identity function (D) Constant function</p> <hr/> <p>3. The value of c in Lagrange's theorem for the function $f(x) = \log \sin x$ in the interval $[\pi/6, 5\pi/6]$ is:
 (A) $\pi/3$ (B) $\pi/2$
 (C) $\pi/4$ (D) None of these</p> <hr/> <p>4. If $P(A) = 0.3$, $P(B) = 0.6$, $P(B/A) = 0.5$, then $P(A \cup B) =$
 (A) 0.60 (B) 0.15
 (C) 0.75 (D) 0.65</p> <hr/> <p>5. If $\begin{vmatrix} x & 3 & 7 \\ 2 & x & 2 \\ 7 & 6 & x \end{vmatrix} = 0$, then x is equal to:
 (A) 2 (B) 7
 (C) -9 (D) All of these</p> | <p>6. The ratio in which the line joining $(1, 2, 3)$ and $(-3, 4, -5)$ is divided by xy plane is:
 (A) 5 : 3 (B) 2 : 3
 (C) 3 : 2 (D) 3 : 5</p> <hr/> <p>7. The area bounded by the parabola $y^2 = 4ax$ and $x^2 = 4ay$ is
 (A) $8a^2/3$ (B) $16a^2/3$
 (C) $8a^3$ (D) None of these</p> <hr/> <p>8. $\int \log(x + \sqrt{x^2 + a^2}) \cdot dx$ is equal to
 (A) $x \log(x + \sqrt{x^2 + a^2}) + \sqrt{x^2 + a^2} + c$
 (B) $x \log(x + \sqrt{x^2 + a^2}) - 2\sqrt{x^2 + a^2} + c$
 (C) $x \cdot \log(x + \sqrt{x^2 + a^2}) - \sqrt{x^2 + a^2} + c$
 (D) None of these</p> |
|--|--|

SPACE FOR ROUGH WORK

ANSWERS

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|-------|-------|-------|-------|-------|-------|-------|-------|
| (1) A | (2) B | (3) B | (4) C | (5) D | (6) D | (7) B | (8) C |
|-------|-------|-------|-------|-------|-------|-------|-------|