



MATHS

BOOKS - HT Olympiad Previous Year Paper

IMO MODEL TEST PAPER -3

Logical Reasoning

1. Which of the following is true about a triangular prism?

- A. It has 2 triangular faces.
- B. It has 3 rectangular faces.
- C. It has 6 vertices.
- D. All of these

Answer: D

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Mathematical Reasoning

1. Simplify:

$$(1^2 + 2^2 + 3^2 + 4^2)^{1/3} \times (1^3 + 2^3 + 3^3 + 4^3)^{1/3} \times (2^2 + 3^2 - 5 \times 2)^{2/3}$$

A. 52

B. 20

C. 13

D. 30

Answer: D

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2. The value of $\frac{\sqrt{0.01 + \sqrt{0.0064}}}{0.01 \times 0.3}$ is _____.

A. 1

B. 10

C. 100

D. 1000

Answer: C



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3. If $x^2 + y^2 = 47$ and $xy = \frac{19}{2}$, then the value of $2(x + y)^2 + (x - y)^2$ is

A. 160

B. 270

C. 226

D. 86

Answer: A



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4. Solve for y : $\frac{3y - 2}{4} - \frac{2y + 3}{3} = \frac{2}{5} - y$.

A. $\frac{23}{13}$

B. $1\frac{49}{65}$

C. $\frac{14}{65}$

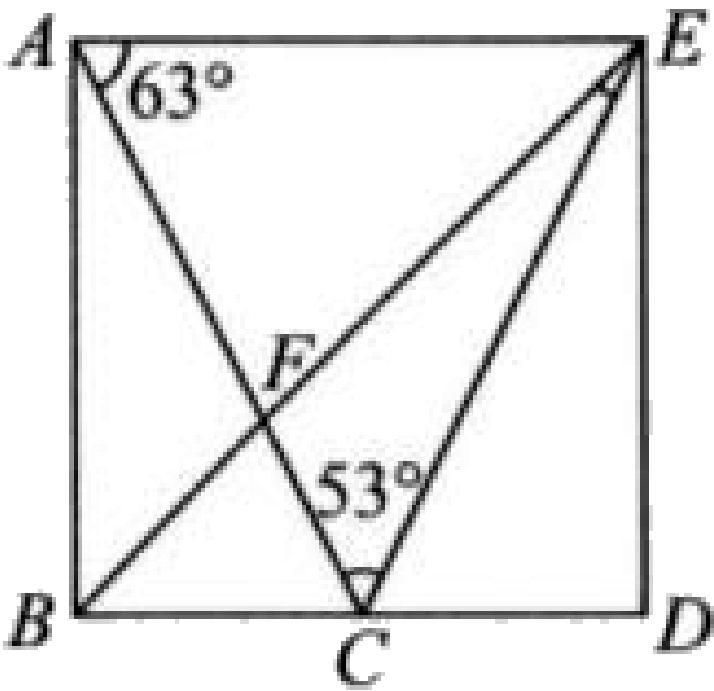
D. 3

Answer: B



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5. In the given figure, EB is the diagonal of square ED \overline{BA} . Find $\angle CEF$ and $\angle ECD$ respectively.



- A. $22^\circ, 60^\circ$
- B. $22^\circ, 64^\circ$
- C. $19^\circ, 64^\circ$
- D. $19^\circ, 60^\circ$

Answer: C

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6. If $x^2 + \frac{1}{x^2} = 16$, then find the value of $x + \frac{1}{x}$.

A. $\sqrt{3}$

B. $2\sqrt{3}$

C. $3\sqrt{2}$

D. $3\sqrt{3}$

Answer: C



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7. If $(t+2)$ units and $(t^2 + 4)$ units are length and breadth of a rectangle respectively, then find its area (in sq. units).

A. $t^3 + 2t^2 + 4t + 8$

B. $t^3 + t + 4t^2 + 8$

C. $t^3 + 8$

D. $t^3 + t^2 + 4 + 8t$

Answer: A



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8. Using Euler's formula, find the value of P, Q and R respectively.

Faces : P, 5, 20

Vertices : 6, Q, 12

Edges : 12, 9, R

A. 7, 5, 25

B. 8, 6, 30

C. 12, 9, 21

D. 20, 2, 18

Answer: B



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9. If $31y5$ is divisible by 15, where y is a single digit, then what would be the values of y ?

A. 1, 2, 5, 8

B. 0, 3, 6, 9

C. 2, 4, 6, 8

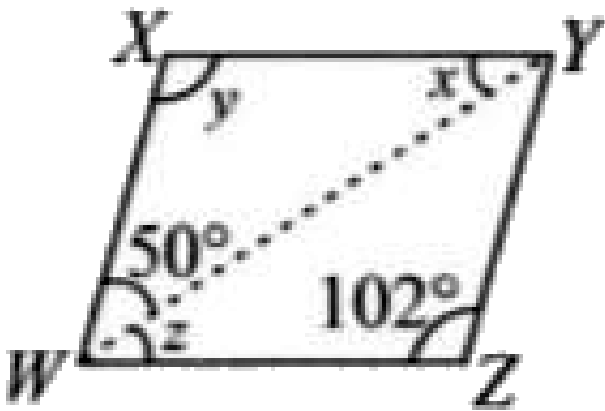
D. 4, 3, 8, 7

Answer: B



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10. In the given parallelogram $XYZW$, find the values of x , y and z respectively.

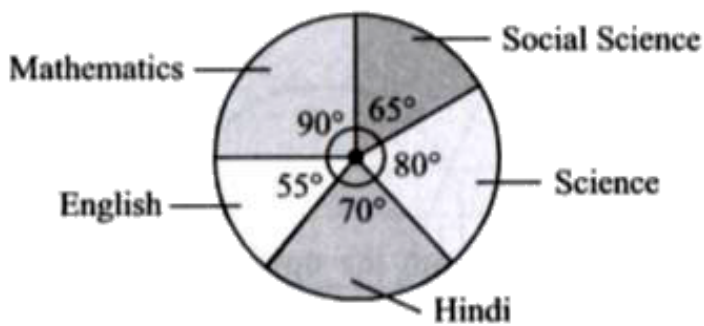


- A. $102^\circ, 28^\circ, 28^\circ$
- B. $28^\circ, 102^\circ, 28^\circ$
- C. $28^\circ, 102^\circ, 102^\circ$
- D. $102^\circ, 28^\circ, 102^\circ$

Answer: B

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11. The given pie chart shows the marks scored by a student in an examination in 5 different subjects.



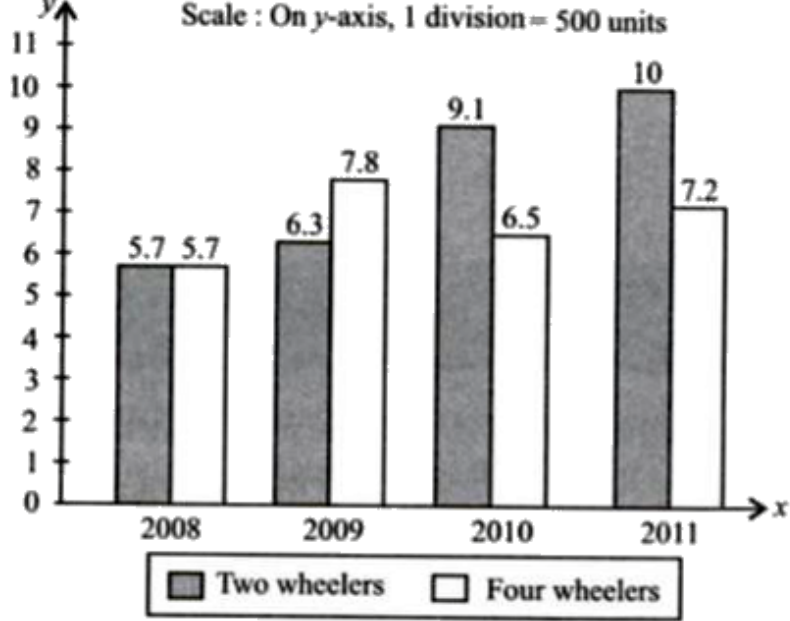
Hindi If the total marks obtained by the students were 1080, then find the marks obtained by him in Mathematics and Hindi together.

- A. 280
- B. 840
- C. 480
- D. 490

Answer: C

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12. The given bar graph represents sales of two wheelers and four wheelers in a city from 2008 to 2011.



Two wheelers Four wheelers Difference between the number of vehicles (two wheelers and four wheelers) sold during 2008 to 2011 is

- A. 2610
- B. 2850
- C. 1305
- D. 1950

Answer: D

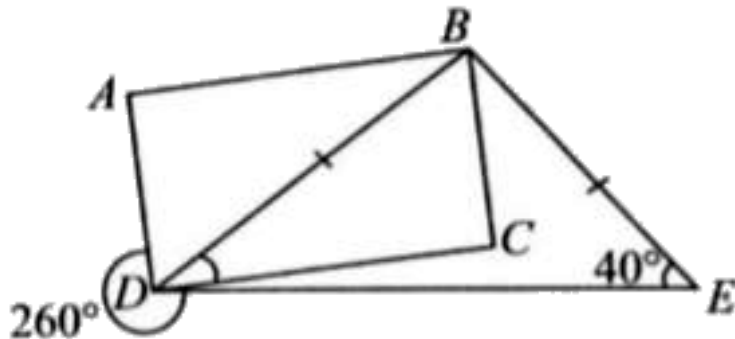


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14. In the figure, ABCD is a rectangle. $BD = BE$, $\angle BED = 40^\circ$ and reflex $\angle EDA = 260^\circ$. Find $\angle CDB$.



- A. 10°
- B. 20°
- C. 30°
- D. 40°

Answer: C



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15. Which of the following statement is INCORRECT?

- A. Diagonals divide the parallelogram into two congruent triangles.
- B. Every square is a rhombus.
- C. All parallelograms are trapeziums.
- D. All rectangles are squares.

Answer: D



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16. If a property holds for whole numbers, then it also holds for _____ .

- A. Rational numbers
- B. Natural numbers
- C. Integers
- D. Both A and C

Answer: D



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17. A rectangular water reservoir contains 42000 litres of water. If the length of reservoir is 6 m and its breadth is 3.5 m. The depth of the reservoir is

A. 5 m

B. 2 m

C. 6 m

D. 8 m

Answer: B



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18. A can complete a work in 10 days and B can complete the same work in 15 days. In how many days they together will do the same work?

A. 5 days

B. 6 days

C. 8 days

D. 9 days

Answer: B



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19. Which of the following statements is INCORRECT?

A. A unique quadrilateral can be constructed, if the length of its 4 sides and a diagonal is given.

B. A unique quadrilateral can be constructed, if its 2 diagonals and 2 sides are given.

C. A unique quadrilateral can be constructed, if its three sides and its two included angles are given.

D. Both A and C

Answer: B



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Everyday Mathematics

1. Mohit is 20 years younger than his father. Three years ago, Mohit's age was one-sixth the age of his father, then find the present age of Mohit.

A. 7 years

B. 6 years

C. 8 years

D. 4 years

Answer: A

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2. In an examination, 35% of the students passed and 455 failed. How many students appeared for the examination?

A. 1440

B. 700

C. 845

D. 1300

Answer: B

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3. Salaries of Ankit and Ansh are in the ratio 2:3. If the salary of each is increased by Rs.4000, the new ratio becomes 40 : 57. What is Ansh's present salary?

A. Rs.17,000

B. Rs.20,000

C. Rs.25,500

D. Rs.34,000

Answer: D



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4. Renuka borrowed Rs.15,000 from Vipul at 5% per annum at simple interest for 3 years. If she had borrowed this sum at same rate and time at compound interest, then what extra amount would she have to pay?

A. Rs.114.38

B. Rs.1483

C. Rs.483.20

D. Rs.43.20

Answer: A



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5. The length of a rectangular plot is 10 metres more than its breadth. If the cost of fencing the plot at Rs.13.25 per metre is Rs.5300, then find the length of the plot.

A. 140 m

B. 150 m

C. 105 m

D. 60 m

Answer: C



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6. The cost of $7\frac{2}{5}$ metres of ribbon is Rs. $12\frac{3}{8}$., find its cost per metre..

A. Rs.2.67

B. Rs.1.67

C. Rs.2.05

D. Rs.1.04

Answer: B



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7. A shopkeeper offers 2.5% discount on cash purchases What cash amount would Rohan pay for a cycle, the marked price of which is Rs.650?

A. Rs.631.25

B. Rs.633.75

C. Rs.632

D. Rs.635

Answer: B



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8. 15 litres of mixture contains 20% alcohol and the rest of water. If 3 litres of water be mixed with it, the percentage of alcohol in the new mixture would be :

A. 15 %

B. $16\frac{2}{3}$ %

C. 17 %

D. $18\frac{1}{2}$ %

Answer: B



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9. A P.T. teacher asks 20736 students to stand in such a way that there are as many rows as there are students in each row. Find the number of rows.

A. 124

B. 126

C. 134

D. 144

Answer: D



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10. Pluto is 59, 130,00,000m from the sun. Express this in the standard form.

A. 5.913×10^{-11}

B. 5.913×10^{-9}

C. 5.913×10^6

D. 5.913×10^9

Answer: D



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Achievers Section

1. Statement-1 : Absolute value of non-zero rational number is always positive.

Statement-2 : Addition and multiplication are commutative for rational numbers.

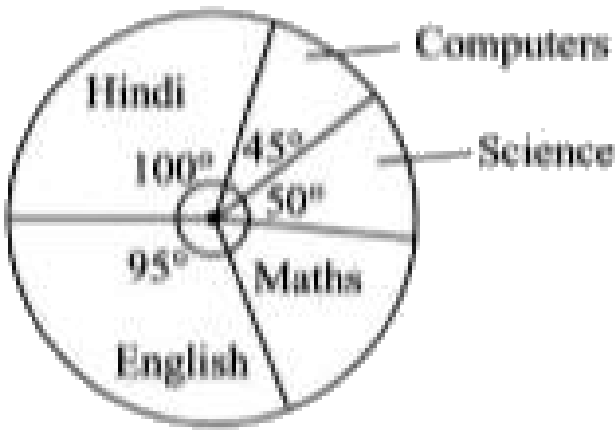
- A. Both Statement-1 and Statement-2 are true.
- B. Statement-1 is true and Statement-2 is false.
- C. Statement-1 is false and Statement-2 is true.
- D. Both Statement-1 and Statement-2 are false.

Answer: A



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2. The given pie chart shows the number of students who likes different subjects. If a student is selected at random, then which of the following option is correct?



Total number of students = 1440

- A. Probability of selecting a student who like Hindi is less than $\frac{7}{29}$
- B. Probability of selecting a student who like Science is more than $\frac{11}{36}$.
- C. Probability of selecting a student who like Computers is more than $\frac{1}{40}$.
- D. Probability of selecting a student who like English lies between 0 and $\frac{1}{4}$.

Answer: C



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3. The given question is followed by three statements to decide whether the question can be answered with any one or two of the statements or all the three statements are required to answer the question. The answer number bearing the statements, which can be dispensed with, if any, while answering the question is your answer.

Mr Gupta borrowed a sum of money on compound interest. What will be the amount to be repaid, if he is repaying the entire amount at the end of 2 years?

I. The rate of interest is 5% p.a.

II. Simple interest fetched on the same amount in one year is Rs.600.

III. The amount borrowed is 10 times the simple interest in 2 years.

A. I only

B. III only

C. I or II only

D. I or III only

Answer: D



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4. Fill in the blanks:

An P is an equality, which is true for all values of the variables in the equality. An Q is not an identity Q are formed from variables and constants.

- A. P - Identity, Q - equation , R- expressions ,
- B. P - Equation ,Q - identity , R-expressions ,
- C. P - Identity ,Q - expression , R-equations ,
- D. P - Equation ,Q - expression , R-identities ,

Answer: A



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5. Select the correct match of the numbers given in Column-I with their cube roots given in Column-II.

	Column-I		Column-II
(i)	804357	P.	69
(ii)	328509	Q.	71
(iii)	357911	R.	93
(iv)	148877	S.	53

A. (i) \rightarrow S, (ii) \rightarrow R, (iii) \rightarrow Q, (iv) \rightarrow P

B. (i) \rightarrow R, (ii) \rightarrow Q, (iii) \rightarrow P, (iv) \rightarrow S

C. (i) \rightarrow S, (ii) \rightarrow P, (iii) \rightarrow Q, (iv) \rightarrow R

D. (i) \rightarrow R, (ii) \rightarrow P, (iii) \rightarrow Q, (iv) \rightarrow S

Answer: D



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