

## MATHS

### BOOKS - HT Olympiad Previous Year Paper

#### IMO MODEL TEST PAPER 2

#### Mathematical Reasoning

1. Diksha earned some money. She spent  $\frac{1}{3}$  of the money on vegetables and  $\frac{1}{4}$  of the money on a dress. Which of the following fractions represents the part of money left with her?

A.  $\frac{5}{12}$

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

C.  $\frac{2}{3}$

D.  $\frac{5}{7}$

**Answer: A**



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2. There are 24 green balls and 30 red balls in a bag. What is the ratio of the number of red balls to the total number of balls?

A. 5 : 9

B. 12 : 17

C. 14 : 23

D. 23: 14

**Answer: A**

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3. Find the value of  $x$  :

$$5(x - 8) - 14(x - 11) + 8\left(x - 2\frac{3}{4}\right) = 0$$

A. 1

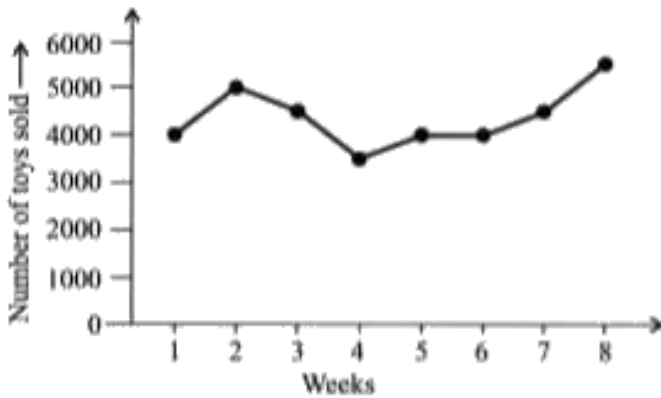
B.  $\frac{9}{2}$

C.  $\frac{-5}{8}$

D. 92

**Answer: D**

4. The given line graph shows the number of toys sold by a toy company in the first 8 weeks of a particular year.



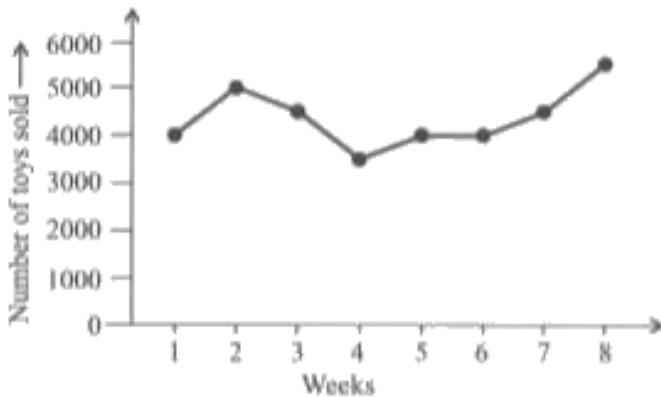
What was the average number of toys sold in 8 weeks?

- A. 4875
- B. 4375
- C. 5892
- D. 2945

**Answer: B**

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5. The given line graph shows the number of toys sold by a toy company in the first 8 weeks of a particular year.



What is the range of the given data?

A. 2000

B. 1000

C. 1500

D. 2500

**Answer: A**



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6. When  $M$  is divided by 15, it leaves a quotient of 9 and a remainder of 14. What is the value of  $M$ ?

A. 149

B. 143

C. 153

D. 147

**Answer: A**



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7. The students of class 7 of a school had a party. They spent Rs. 800 for a local band. If the students sold  $x$  tickets and cost of each ticket is Rs. 9, then what is the total profit,  $y$  (in Rs.) of the party ?

A.  $y = 4x - 800$

B.  $y = 9x - 800$

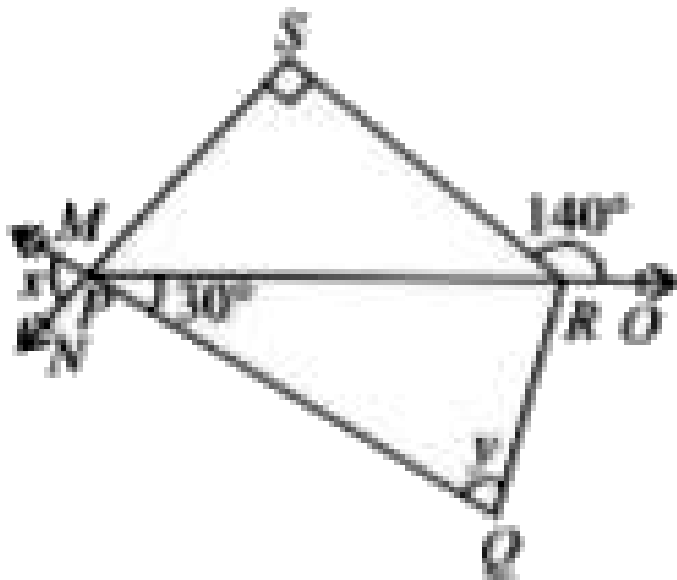
C.  $y = \frac{800}{9} - 9x$

D.  $y = 9x + 800$

**Answer: B**



8. In the given figure (not drawn to scale),  $\triangle PRS$  is a right-angled triangle,  $\triangle PQR$  is an isosceles triangle with  $PQ=PR$  and  $PRO$ ,  $MPQ$  and  $NPS$  are straight lines. Find the value of  $x$ ,  $y$  and  $2x - y$  respectively.



A.  $70^\circ$ ,  $85^\circ$ ,  $80^\circ$



B.  $80^\circ$ ,  $75^\circ$ ,  $85^\circ$

C.  $70^\circ$ ,  $80^\circ$ ,  $85^\circ$

D.  $75^\circ$ ,  $85^\circ$ ,  $80^\circ$

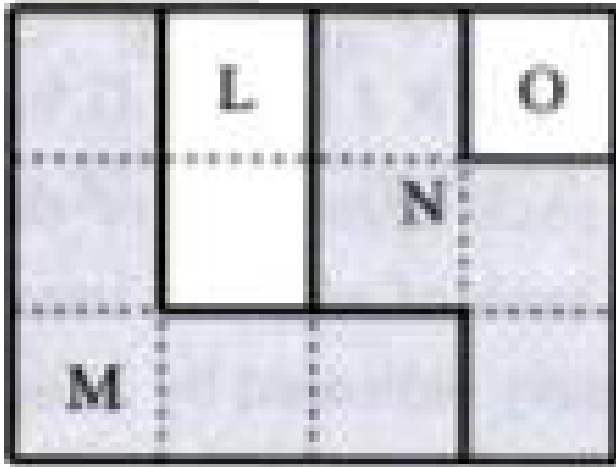
**Answer: B**



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**9.** The given rectangle is made up of 12 identical squares. It is divided into 4 parts. Which of the following 2 parts will

be removed to form  $\frac{3}{12}$  of the rectangle?

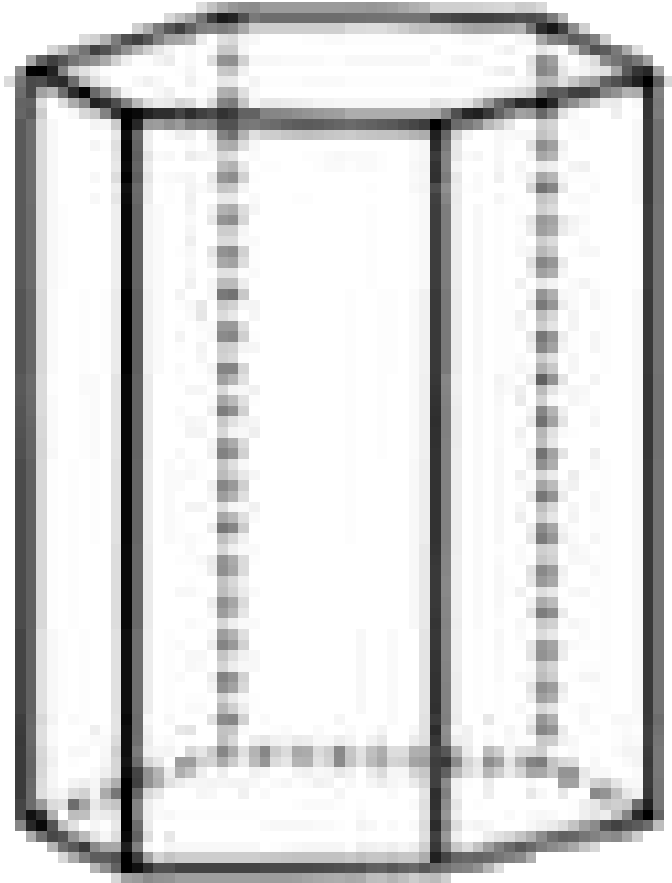


- A. L and N
- B. M and O
- C. L and M
- D. M and N

**Answer: D**

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10. How many faces, edges and vertices does the given solid have respectively?



A. 8,12,18

B. 10,18,12

C. 8,18,12

D. 10,12,18

**Answer: C**



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11. Evaluate :  $\frac{2\frac{5}{4} - 4\frac{7}{6} + 3\frac{1}{3}}{5\frac{2}{9} - 2\frac{4}{9} - 1\frac{1}{9}}$

A.  $1\frac{1}{12}$

B.  $\frac{17}{20}$

C.  $1\frac{4}{17}$

D.  $1\frac{2}{3}$

**Answer: B**



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**12.** The largest number which divides 77, 147, and 252 to leave the same remainder in each case is-

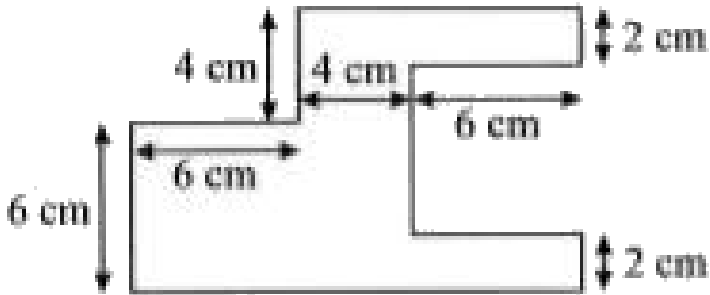
- A. 9
- B. 15
- C. 25
- D. 35

**Answer: D**



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13. Find the area of the given figure (not drawn to scale).



A.  $200 \text{ cm}^2$

B.  $94 \text{ cm}^2$

C.  $84 \text{ cm}^2$

D.  $100 \text{ cm}^2$

**Answer: D**



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14. Which of the following equations satisfy the values of  $x$  and  $y$  given in the table?

$x$	$y$
2	7
3	9
4	11
5	13
6	15

A.  $y = x - 5$

B.  $y = x + 5$

C.  $y = 2x - 3$

D.  $y = 2x + 3$

**Answer: D**



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15. If  $\frac{x}{y} = \frac{9}{8}$ , then the value of  $\left(\frac{6}{7} + \frac{y-x}{y+x}\right)$  is

A.  $\frac{9}{119}$

B.  $\frac{95}{119}$

C.  $\frac{19}{119}$

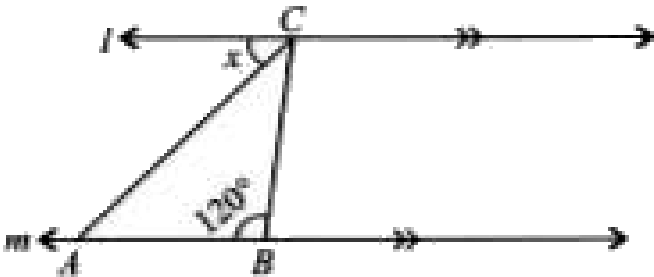


D.  $1\frac{9}{119}$

Answer: B

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16. In the given figure (not drawn to scale),  $l \parallel m$  and  $AB=BC$ , find the value of  $x$ .



A.  $45^\circ$

B.  $48^\circ$

C.  $20^\circ$

D.  $30^\circ$

**Answer: D**



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17. The side of a square plot is 100 m. Two paths each of 4 m wide along the sides of the square are constructed in the middle of the plot. Find the area of the path and the cost of paving the path, if the cost of paving 10 sq. m area is Rs. 42.

A.  $784 \text{ m}^2$ , Rs. 3292.80

B.  $624 \text{ m}^2$ , Rs. 3248.90

C.  $624 \text{ m}^2$ , Rs. 960.53

D.  $784 \text{ m}^2$ , Rs. 3450

**Answer: A**



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**18.** The diameter of a scooter wheel is 98 cm. How much distance will it cover in 5 revolutions?

A. 1660 cm

B. 1875 cm

C. 1540 cm

D. 1760 cm

**Answer: C**



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19. Find the value of the given expression.

$$(-145) - (-239) + 421 - 289 - (-652) - 185 + (-59)$$

A.  $-278$

B.  $-32$

C.  $-550$

D.  $634$

**Answer: D**



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20. Niharika is 6m years old. She is thrice as old as her brother. What will be the sum of their ages after six years?

A.  $(8m + 6)$  years

B.  $(8m + 12)$  years

C.  $(24m + 6)$  years

D.  $(24m + 12)$  years

**Answer: B**



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## Everyday Mathematics

1. Amrita and her grandmother both had birthdays on same day. The sum of their ages is 100 years. Amrita's grandmother's age is 4 times her age. Find their present ages.

- A. 25 years, 75 years
- B. 20 years, 80 years
- C. 22 years, 88 years
- D. 25 years, 100 years

**Answer: B**

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2. Arun sells a car to his friend Amit at 10% loss. If Amit sells the car for 54000 and gains 20% then the original cost price of the car was

- A. Rs. 25000
- B. Rs. 37500

C. Rs. 50000

D. Rs. 60000

**Answer: C**



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**3.** Mr Prateek has Rs. 15000 in total. He spends 35% of his money on his child's education and saves the rest. How much amount does he save?

A. Rs. 5000

B. Rs. 5500

C. Rs. 9750

D. Rs. 5250

**Answer: C**



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4. Each of two groups of students has 76 students. If  $\frac{3}{4}$  students of the first group and  $\frac{8}{19}$  students of the second group board buses to travel to a museum, then how many more students of the first group board buses than of the second group ?

A. 29

B. 42

C. 25

D. 40



**Answer: C**



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5. A certain amount was divided between A and B in the ratio 4:3. If B's share was Rs. 4800, the total amount was :

A. Rs. 11200

B. Rs. 6400

C. Rs. 19200

D. Rs. 39200

**Answer: A**



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6. The temperature of a town at 3p.m. was  $21^{\circ}C$ . Every hour it decreases by  $3^{\circ}C$ . What will be the temperature at 6 p.m.?

A.  $3^{\circ}C$

B.  $0^{\circ}C$

C.  $12^{\circ}C$

D.  $-6^{\circ}C$

**Answer: C**



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7. Jasmine uses 90 beads to make 5 necklaces. How many of the same type of necklaces can she make with 450 beads?

A. 20

B. 25

C. 432

D. 972

**Answer: B**



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8. A certain freezing process requires that room temperature be lowered from  $40^{\circ}C$  at a rate of  $5^{\circ}C$  at

every hour. Find the room temperature, 10 hours after the freezing process begins.

A.  $10^{\circ} C$

B.  $5^{\circ} C$

C.  $-5^{\circ} C$

D.  $-10^{\circ} C$

**Answer: D**



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**9.** A person borrowed Rs. 500 @ 3% per annum S.I. and Rs 600 @  $4\frac{1}{2}\%$  per annum on agreement that the whole sum will be returned only when the total interest becomes Rs.

126. The number of years, after which the borrowed sum is to be returned, is

A. 2 years

B. 3 years

C. 4 years

D. 5 years

**Answer: B**



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10. Tripti had Rs. 1350. She donated half of it to charity and saved  $\frac{1}{3}$  of the remainder. How much amount did she save?

A. Rs. 335

B. Rs. 225

C. Rs. 235

D. Rs. 325

**Answer: B**



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## Achievers Section

1. Which of the following statements is sufficient to answer the following question?

The simple interest on a sum of money is Rs. 50. What is the sum ?

I. The interest rate is 10 % p.a.

II. The sum earned at simple interest in 10 years.

A. Only I

B. Only II

C. Neither I nor II

D. Both I and II

**Answer: D**



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**2. Which of the following statements is CORRECT ?**

(i) If two geometric figures superimpose each other exactly when placed one over the other, then the figures are said

to be congruent to each other.

(ii) If two sides and the included angle of one triangle are equal to corresponding sides and the included angle of another triangle, then the two triangles are congruent to each other by SAS (Side-Angle-Side) congruency.

(iii) If two angles and the included side of one triangle are equal to corresponding angles and the included side of another triangle, then the two triangles are congruent to each other by ASA (Angle-Side-Angle) congruency.

A. Only (i)

B. Only (ii) and (iii)

C. Only (i) and (ii)

D. (i), (ii) and (iii)

**Answer: D**





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3. Match the following.

Column-I

Column-II

$$(P) \quad \left[ (5^3)^2 \times 5^5 \right] \div 5^9 \quad (i) \quad (-6)^3$$

$$(Q) \quad (-6)^5 \div (6)^2 \quad (ii) \quad 2$$

$$(R) \quad (5^0 + 3^0) \div 8^0 \quad (iii) \quad 1$$

$$(S) \quad \left( \frac{7}{19} \right)^0 \quad (iv) \quad 25$$

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

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

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

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

Answer: C



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4. Which of the following steps is INCORRECT while constructing  $\triangle XYZ$  if it is given that  $XY = 6$  cm,  $\angle ZXY = 30^\circ$  and  $\angle XYZ = 100^\circ$  ?

Step 1 :

Draw line XY of length 6 cm.

Step 2 : At X, draw a ray XP making an angle of  $30^\circ$  with XY.

Step 3 : At Y, draw a ray YQ making an angle of  $100^\circ$  with YX.

Step 4 : The point of intersection of the two rays XY and YQ is Z.

- A. Step 1 and Step 3
- B. Step 2 and Step 4
- C. Step 3

## D. Step 4

**Answer: D**

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5. Fill in the blanks.

- The  $P$  The  $P$  consist of natural numbers, zero and negative of natural numbers.
- Zero is called the  $Q$
- $R$  is called the multiplicative identity.

A.  $P$                        $Q$                                        $R$   
Integers      additive identity      1

B.  $P$                        $Q$                                        $R$   
Integers      additive inverse      1

C.  $P$                                        $Q$                                        $R$   
Whole numbers      additive identity      0

	$P$	$Q$	$R$
D.	Rational numbers	additive inverse	0

**Answer: A**



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