MATHS

BOOKS - HT Olympiad Previous Year Paper

IMO QUESTION PAPER 2017-18 SET A

Mathematical Reasoning

1. If the vertices and faces of a solid are 34 and 18 respectively, then find the number of edges of

the solid.

A. 48

B. 50

C. 52

D. 46

Answer: B

Watch Video Solution

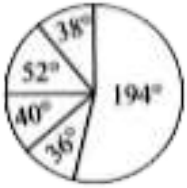
2. The expendicute incurred on various things during the construction of a house are given

below.

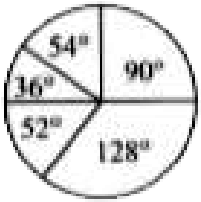
Items	Expenditure (₹ in thousands)
Bricks	180
Cement	80
Timber	90
Steel	55
Wood	45
Total	**450**

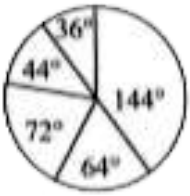
Which of the following pie charts exhibits the given information?

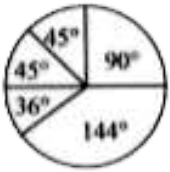
A.



B.



C. 

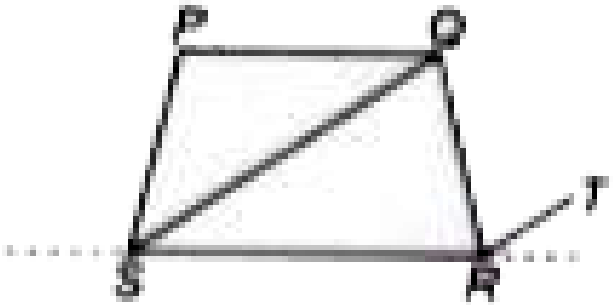
D. 

Answer: C

Watch Video Solution

3. In the given figure line RT is drawn parallel to SQ. If $\angle QPS = 100^\circ, \angle PQS = 40^\circ, \angle PSR = 85^\circ$

and $\angle QRS = 70^\circ$, then $\angle QRT =$



A. 45°

B. 65°

C. 85°

D. 90°

Answer: B

Watch Video Solution

4. Find the value of p from $\frac{2}{x} + p = 3$, when $\frac{5(7x+5)}{3} - \frac{23}{3} = 13 - \left(\frac{4x-2}{3}\right)$

A. 0

B. 1

C. 2

D. 3

Answer: B

Watch Video Solution

5. One card is drawn from a well shulfiled deck of 52 cards. Find the probability that the number on the card drawn is a multiple of 5.

A. $\frac{4}{52}$

B. $\frac{4}{13}$

C. $\frac{7}{52}$

D. $\frac{2}{13}$

Answer: D

Watch Video Solution

6. What is the least number which should be subtracted from 0.000326 to make it a perfect square? (a) 0.000002 (b) 0.000004 (c) 0.02 (d) 0.04

A. 0.000002

B. 0.000004

C. 0.02

D. 0.04

Answer: A

 Watch Video Solution

7. Which of the following statements is INCORRECT?

A. If a and b are consecutive rational numbers where $a < b$, then $\frac{a+b}{2} < b$.

B. $\frac{x+y}{2}$ is a rational number which lies between x and y.

C. Rational numbers are associative under subtraction.

D. The rational numbers $\frac{5}{3}$ and $\frac{-1}{3}$ are lying on the opposite sides of 0 on the number line.

Answer: C

Watch Video Solution

8. If the height of a cylinder becomes $\frac{1}{2}$ of the original height and the radius is doubled, then volume of cylinder becomes _____ of its original volume.

A. 2 times

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

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

D. 3 times

Answer: A

Watch Video Solution

9. If $\left(a^2+b^2\right)^3=\left(a^3+b^3\right)^2$ and $ab \neq 0$ then $\left(\frac{a}{b}+\frac{b}{a}\right)^6$ is equal to :

A. $\frac{a^6 + b^6}{a^3 b^3}$

B. $\frac{64}{729}$

C. 1

D. $\frac{a^6 + a^3 b^3 + b^6}{a^2 b^4 + a^4 b^2}$

Answer: B

Watch Video Solution

10. The difference between compound interest and simple interest on a sum for 2 years at 8 per cent is Rs 768. The sum is

A. `Rs. 110000

B. Rs. 120000

C. Rs. 100000

D. Rs. 170000

Answer: B

Watch Video Solution

11. The area of a quadrilateal is 342 sq. m. The perpendiculars from two of its opposite vertices

to the diagonal are 12m and 12m. What is the length of the diagonal?

A. 28.6m

B. 25.3m

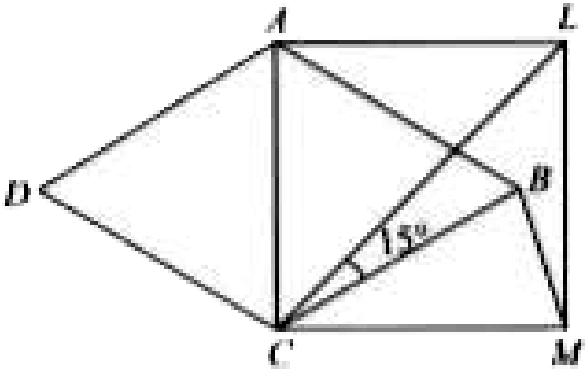
C. 28.5m

D. 22.5m

Answer: C

Watch Video Solution

12. In the given figure (not drawn to scale), ABCD is a rhombus and ALMC is a square AC=BC. Find $\angle MBC$.



A. 60°

B. 75°

C. 30°

D. 45°

Answer: B

Watch Video Solution

13. Solve for x:-

$$2(x+5)-(x-6)=3(x+7)-3$$

A. 1

B. -1

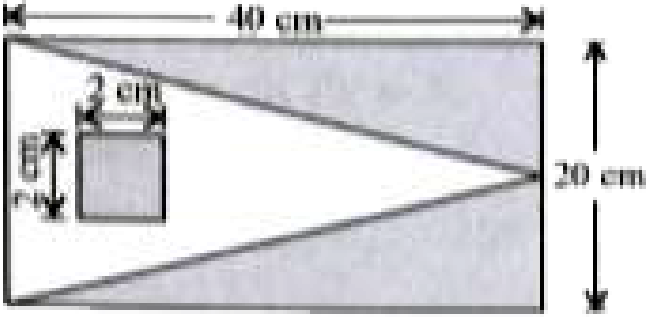
C. 2

D. 0

Answer: B

Watch Video Solution

14. Find the total area of shaded region in the given figure.



A. $400cm^2$

B. $404cm^2$

C. $396cm^2$

D. $275cm^2$

Answer: B

Watch Video Solution

15. In a five digit number 1b6a3 a is the greatest single digit perfect cube and twice of it exceeds b by 7 .Then the sum of the number and it cube root is_____

A. 18700

B. 1182

C. 19710

D. 25320

Answer: C

Watch Video Solution

16. Select the CORRECT match

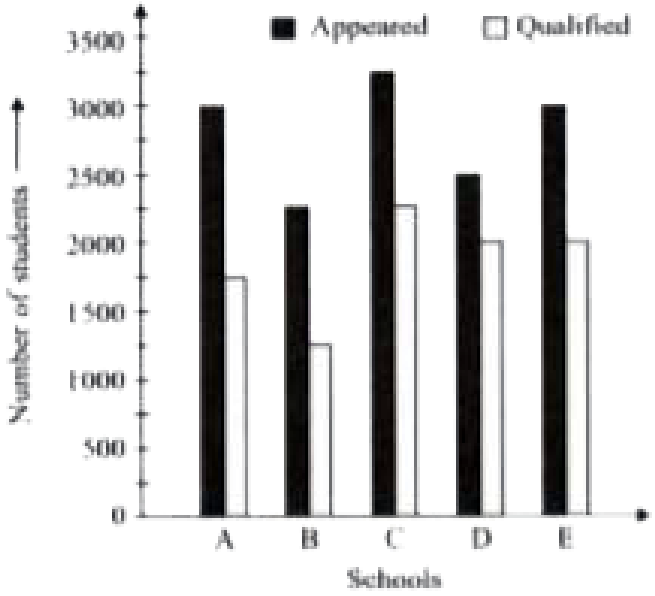
	Item	S.P.	Discount rate	Marked price
A.	Sofa set	₹ 9000	10%	₹ 9500
B.	Dining table	₹ 16000	20%	₹ 20000
C.	Double bed	₹ 10200	15%	₹ 14000
D.	Centre table	₹ 900	25%	₹ 1500

Watch Video Solution

Watch Video Solution

17. Study the following graph carefully and answer the questions given below:

Total number of students Appeared and Qualified from Various Schools at a Scholarship Exam



The average number of studens qualified in the examination from schools C and D is what percent of the average number of students appeared for the examination from the same schools? (Rounded off to 2 digits after decimal).

A. 0.5862

B. 0.7391

C. 0.6258

D. 0.5896

Answer: B

Watch Video Solution

18. What is the ratio of the number of students qualified in the scholarship examination from School A and the number of students qualified in the examination from School B ? (a) 8 : 3 (b) 5 : 7 (c) 7 : 3 (d) 7 : 5 (e) None of these

A. $8:3$

B. $5:7$

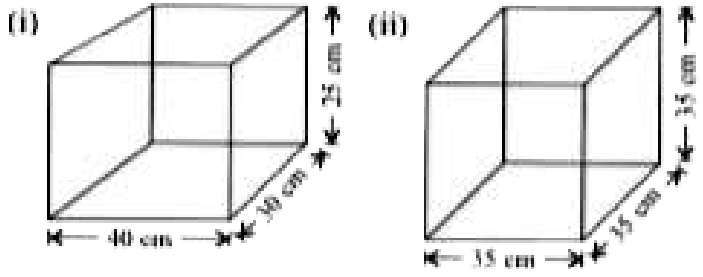
C. $7:3$

D. $7:5$

Answer: D

Watch Video Solution

19. There are two boxes shown in the figure. Which box requires more amount of material to be made?



A. Box(i)

B. Box(ii)

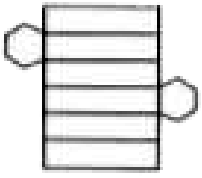
C. Both requires equal amount of material

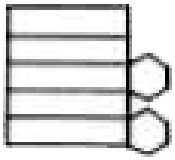
D. Can't be determined

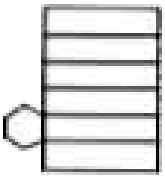
Answer: B

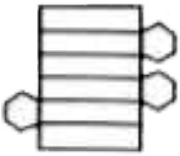
Watch Video Solution

20. Which of the folowing is the net of a hexagonal prism?

A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution

Everyday Mathematics

1. A loan was repaid in two annual instalments of Rs. 3630 each. If the rate of interest be 10% per annum compounded annually, then find the sum that was borrowed.

A. Rs. 5200

B. Rs. 6100

C. Rs. 6300

D. Rs. 5600

Answer: C

Watch Video Solution

2. The perimeter of a rectangular garden is 420 cm. If its length is increased by 20% and breadth is decreased by 40%, we get the same perimeter. Then the length and breadth of the new rectangular garden, respectively are

A. 115 cm and 95 cm,

B. 168 cm and 42 cm

C. 210 cm and 210 cm

D. 95 cm and 115 cm

Answer: B

Watch Video Solution

3. A book was sold for Rs. 27.50 with as profit of 10%. If it were sold for Rs. 25.7, then what would have been the percentage of profit or loss?

A. Profit, 3%

B. Loss, 5%

C. Profit, 5%

D. Loss, 3%

Answer: A

Watch Video Solution

4. A man buys a house Rs. 5 lakh and rents it. He puts o each months rent aside for repairs, pays Rs. 1660 as annual taxes and realizes 10% on his investment thereafter. Find the monthly rent of the house.

A. Rs. 2460

B. Rs. 2500

C. Rs. 4920

D. Rs. 5000

Answer: C

5. A group of students decided to collect as many paise from each member of the group as is the number of members. If the total collection amounts to Rs 59.29, the number of members in the group is (a) 57 (b) 67 (c) 77 (d) 87

A. 57

B. 67

C. 77

D. 87

Answer: C

 Watch Video Solution

6. A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm. If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to prepare daily to serve 250 patients?

A. 38L

B. 40L

C. 39.5L

D. 38.5L

Answer: D

Watch Video Solution

7. Amit started a business investing Rs.25000. After 3 months, Vinay joined him with a capital of Rs.30000. At the end of the year, they make a

profit of Rs.19000. What will be Amit's share in the profit?

A. Rs. 9423

B. Rs. 12500

C. Rs. 14000

D. Rs. 10000

Answer: D

Watch Video Solution

8. In a simultaneous throw of two dice, what is the probability of getting a doublet? $\frac{1}{6}$ (b) $\frac{1}{4}$ (c) $\frac{2}{3}$ (d) $\frac{3}{7}$

A. $\frac{1}{4}$

B. $\frac{5}{6}$

C. $\frac{1}{6}$

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

Answer: C

Watch Video Solution

9. A mixture contains milk and water in the ratio 5:1. On adding 5 litres of water, the ratio of milk to water becomes 5:2. The quantity of milk in the original mixture is

A. 16 litres

B. 22.75 litres

C. 25 litres

D. 32.5 litres

Answer: C

Watch Video Solution

10. The average weight of 120 student in the second year class of college is 56kg. If the average weight of boys and that of girls in the class are 60kg and 50 kg respectively,then the number of boys and girls in the class are respectively,

A. 72

B. 38

C. 64

D. 57

Answer: A

Watch Video Solution

Achievers Section

1. Find the value of P,Q,R and S respectively.

	Principal (in ₹)	Time (in years)	Rate (in %)	S.I. (in ₹)	C.I. (in ₹)
(i)	12,500	3	P	4,500	4137.5
(ii)	8,800	2	$8\frac{1}{2}$	Q	10359.58
(iii)	R	3	5	180	S

A. $P \quad Q \quad R \quad S$

$12 \quad 1526 \quad 1500 \quad 1467.25$

B.

P	Q	R	S
15	1496	1800	1525.38

C.

P	Q	R	S
12	1496	1200	189.15

D.

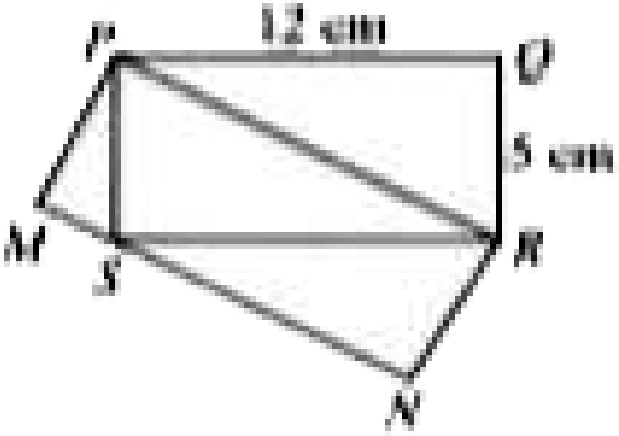
P	Q	R	S
12	1426	1200	1389.32

Answer: C

Watch Video Solution

2. PQRS is are rectangle of dimensions 12 cm and 5 cm. PMNR is a rectangle drawn is such a way that the diagonal PR of the first rectangle is one of its sides and side opposie to it is touching the

first rectangle at S as shown in figure. What is the ratio of the area of rectangle PQRS to that of PMNR?



A. $3:1$

B. $2:3$

C. $1:1$

D. $5:4$

Answer: C

Watch Video Solution

3. Arrange the following seps in correct order in constructing a quadrilaerla PQRS, given $PS = 3.2cm, PQ = 5.6cm, \angle P = 60^\circ, \angle Q = 75^\circ$ and $\angle R = 90^\circ$

Step 1: At Q draw $\angle YQP = 75^\circ$ so tha YQ intersecs MS at R.

Step 2: With P as centre and radius 3.2 cm, draw ar arc to cu PX at S.

Step 3: Draw PQ =5.6 cm.

Step 4: At P, draw $\angle XPQ = 60^\circ$

Step 5: At S draw $\angle MSP = 135^\circ$

A. 3,4,1,5,2

B. 3,1,2,5,4

C. 3,2,1,5,4

D. 3,4,2,5,1

Answer: D

Watch Video Solution

4. Fill in the blanks.

(i) The range of the data, 15, 4,16,20,5,6,16,8,2,1,19,0, is $\underline{P}$.

(ii) Probability of an impossible event is $\underline{Q}$

(iii) The number of times a particular observation occurs in given data is called $\underline{R}$

(iv) In a single throw of two dice, the probability of getting a total of 11 is $\underline{S}$

A.

P	Q	R	S
18	1	frequency	$\frac{1}{12}$

B.

P	Q	R	S
20	0	frequency	$\frac{1}{18}$

C.

P	Q	R	S
19	0	classmark	$\frac{1}{9}$

D.

P	Q	R	S
20	1	raw data	$\frac{1}{18}$

Answer: B

Watch Video Solution

5. Read the statement carefully and selec the correct option.

Statement 1: The value of

$$\frac{\sqrt[6]{2}\left[(625)^{3/5} \times (1024)^{-6/5} \div (25)^{3/5}\right]^{1/2}}{\left[\left(\sqrt[3]{128}\right)^{-5/2}\right] \times (125)^{1/5}}$$ is 1

Statement -2: The expression

$\left(x^{-2p}y^{3q}\right)^{6} \div \left(x^{3}y^{-1}\right)^{-4p}$, after simplification becomes independent of both x and y.

A. Both Staement 1 and Staement 2 are true

B. Statement 1 is true but Statement 2 is false.

C. Statement 1 is false but Staement 2 is true.

D. Both Statement 1 and Statement 2 are false.

Answer: B

Watch Video Solution