MATHS

BOOKS - HT Olympiad Previous Year Paper

IMO QUESTION PAPER 2019-20 SET A

Mathematical Reasoning

1. Arrange the steps of construction while constructing a quadrilateral PQRS given that PQ = 4.2 cm, PS = 3 cm, QR = 1.5 cm, $\angle P = 60°$ and $\angle Q = 75°$

Steps of construction :

Step 1 : With Q as centre and radius 1.5 cm, cut off QR = 1.5 cm along QX

Step 2 : Construct $\angle QPY = 60°$ at P

Step 3 : Join RS

Step 4 : With P as centre and radius 3 cm, cut off PS = 3 cm along PY

Step 5 : Draw PQ = 4.2 cm

Step 6 : Construct $\angle PQX = 75°$ at Q

A. 5, 2, 4, 1, 3, 6

B. 5, 4, 2, 1, 6, 3

C. 5, 2, 4, 6, 1, 3

D. 5, 2, 4, 1, 6, 3

Answer: C

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2. Find the value of

$$\left(\sqrt{\frac{625}{4356}} + \sqrt{\frac{576}{1089}}\right) \times \left(\frac{66}{\sqrt{19600} + \sqrt{36}}\right)$$

A. $\dfrac{7}{15}$

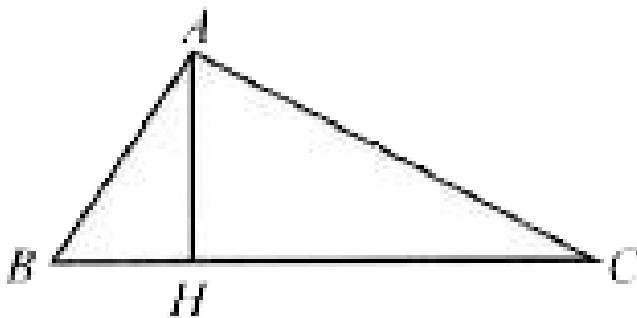B. $\dfrac{9}{53}$

C. $\dfrac{1}{2}$

D. $\dfrac{79}{33}$

Answer: C

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3. ABC is a right angled triangle with $\angle BAC = 90°$ AH is

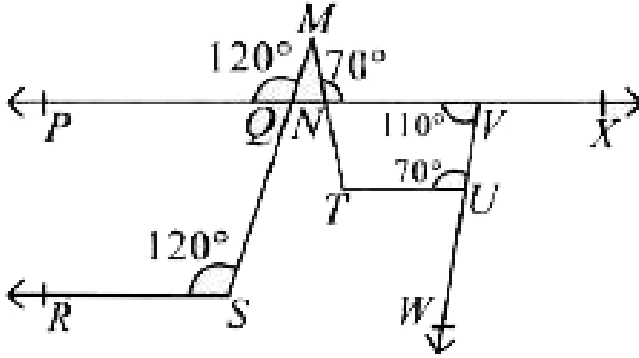drawn perpendicular to BC. If AB = 60 cm and AC = 80 cm,

then BH = ____

A. 36 cm

B. 32 cm

C. 24 cm

D. 30 cm

Answer: A

4. If all lines are straight lines in the given figure, then which of the following options is incorrect ?

A. PQ || RS

B. $\angle NVU + \angle NTU = 180°$

C. MT || VW

D. None of these

Answer: C

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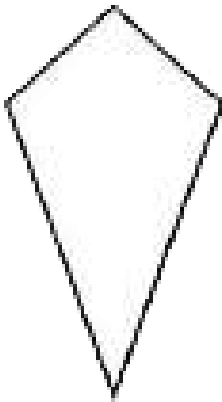**5.** The sum of the order of rotaional symmetry of Figure - P and Figure - Q is ____
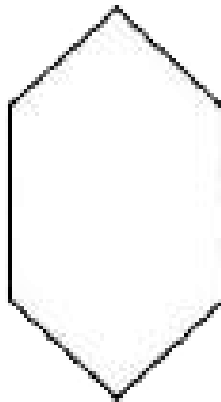

Figure-P   Figure-Q

A. 0

B. 1

C. 2

D. 3

Answer: D

6. Find the median and mode respecively of the given data

92, 42, 62, 86, 48, 29, 62, 64, 42, 62, 82

   A. 62, 62

   B. 42, 42

   C. 62, 42

   D. 82, 62

Answer: A

7. A die is thrown once. Find the probability that the number on the uppermost face is

(a) 5

(b) not a multiple of 2

A. | (a) | (b) |
|-----|-----|
| 5/6 | 1/6 |

B. | (a) | (b) |
|-----|-----|
| 1/2 | 3/2 |

C. | (a) | (b) |
|-----|-----|
| 1/6 | 1/2 |

D. | (a) | (b) |
|-----|-----|
| 3/4 | 1/4 |

Answer: C

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8. Simplify :

$$\frac{\left(\frac{4}{3} \times \left(-\frac{25}{2}\right)\right) + \left(\left(-\frac{10}{3}\right) \times \frac{5}{2}\right) - \left(\left(-\frac{16}{3}\right) \times \left(\frac{-45}{32}\right)\right)}{\frac{3}{4} \times \left(\frac{9}{14} \times \left(-\frac{2}{18}\right)\right)}$$

A. $13\dfrac{11}{27}$

B. $606\dfrac{2}{3}$

C. $-133\dfrac{7}{4}$

D. $606\dfrac{7}{3}$

Answer: B

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9. Which of the following options in incorrect ?

A. A quadrilateral having exactly one pair of parallel sides is called a trapezium

B. The measure of each exterior angle of an n-sided regular polygon is $\left(\dfrac{180°}{n} \right)$

C. A quadrilateral is a rhombus, if its all sides are equal and diagonals bisect each other at right angles

D. None of these

Answer: B

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10. Vineet invests a sum of Rs. 41250 at the rate of 5% per annum. What compound interest will he obtain at the end

of 3 years ?

A. Rs. 8100.10

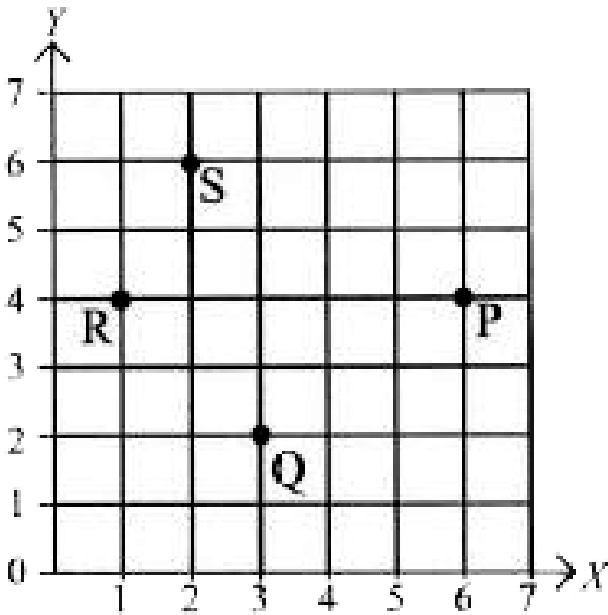B. Rs. 6502.03

C. Rs. 8210.70

D. Rs. 7879.04

Answer: B

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11. Study the given graph carefully and find

(i) the coordinates of P

(ii) the difference between the abscissa of S and ordinate of

Q

A.
(i)	(ii)
(2,4)	2

B.
(i)	(ii)
(4,6)	1

C.
(i)	(ii)
(6,4)	0

D.
(i)	(ii)
(4,4)	0

Answer: C

12. If the distance travelled by a bus in 2 hours is 310 km, then the distance travelled by the same bus with the same speed in 360 second is _____

A. 20 km

B. 3 km

C. 3.5 km

D. 15.5 km

Answer: D

13. Two cubes have volumes in the ratio 27 : 216 . What is the ratio of the area of the face of one cube to that of the other cube ?
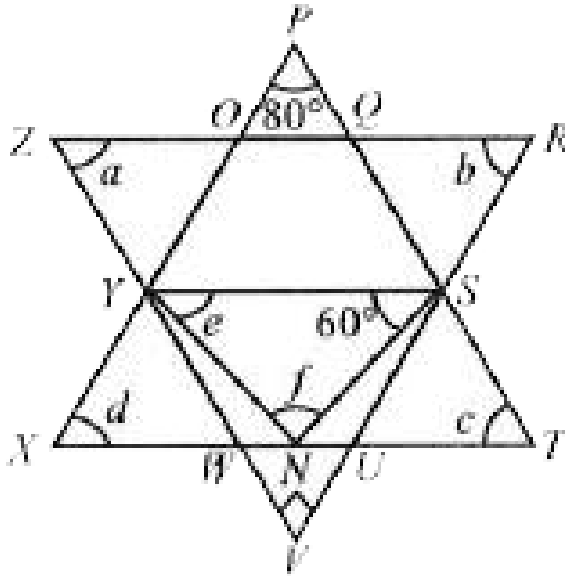
A. $1:4$

B. $1:6$

C. $1:9$

D. $1:18$

Answer: A

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14. Find the value of ∠(a + b) - ∠(e + f) + ∠(c + d) , if

$\angle WVU = 90°$

A. 90°

B. 70°

C. 200°

D. 210°

Answer: B

15. A 5 - digit number xy235 is divisible by 3 such that $x + y < 5$ where x and y are single digits then possible values of (x, y) are _____

A. (1,1) or (4, 0)

B. (1,1) or (2, 0)

C. (1,1) or (0,3)

D. (2, 0) or (0,2)

Answer: B

16. Factorise : $\sqrt{2}y^2 + 8y + 6\sqrt{2}$

A. $(y + 3\sqrt{2})(\sqrt{2}y - 2)$

B. $(y + \sqrt{2})(\sqrt{2}y + 2)$

C. $(y + 3\sqrt{6})(\sqrt{2}y + 2)$

D. None of these

Answer:

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17. The given line graph shows the number of books read by

Shivani in 7 months
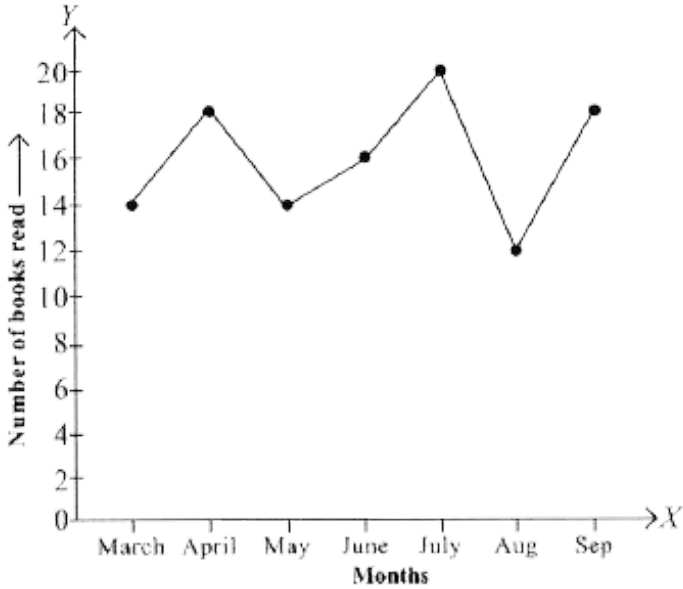
What is the ratio of number of books read in May and July together to the total number of books read in 7 months ?

A. 12 : 71

B. 3 : 7

C. 17 : 56

D. 16 : 7

Answer: C

18. Solve for m : $\dfrac{(m + 2)(2m - 3) - 2m^2 + 6}{m - 4} = 7$

A. $\dfrac{14}{3}$

B. 10

C. 15

D. $\dfrac{20}{3}$

Answer: A

19. A card is drawn from a packet of 50 cards numbered 1 to 50. Find the probability of drawing a card with a prime number

A. $2/25$

B. $7/25$

C. $3/10$

D. None of these

Answer: C

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20. If a, b and c are rational numbers, then associativity of rational numbers under multiplication is given by

A. $a \times b = b \times a$

B. $a + (b + c) = (a + b) + c$

C. $a \times (b \times c) = (a \times b) \times c$

D. $a \times (b + c) = (a \times b) + (a \times c)$

Answer: C

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Everyday Mathematics

1. Raghav spent Rs. 55760 on the interior decoration for his home, Rs. 37896 on buying are conditioner and the remaining 54 % of the total amount he had as cash with him. What was the total amount ?

    A. Rs. 203600

    B. Rs. 102300

    C. Rs. 134560

    D. Rs. 230600

Answer: A

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2. A rectangular block of ice measures 40 cm by 25 cm b 15 cm. Find the weight of the block, if ice weights $\frac{9}{10}$ of the weight of the same volume of water and 1 cm^3 of water weights 1 g

   A. 9 kg

   B. 13.5 kg

   C. 8 kg

   D. 9.5 kg

Answer: B

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3. 4 years ago, the average age of Sakshi, Anjali and Samridhi was 32 years ,6 year ago the average age of Anjali and Samridhi was 30 years. Find the present age of Sakshi

    A. 50 years

    B. 48 years

    C. 36 years

    D. 42 years

Answer: C

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4. If (x - 5) notebooks cost Rs $\left(x^2 - 13x + 40\right)$ then what is the cost of one notebook ?

   A. Rs. (x - 1)

   B. Rs. (x - 2)

   C. Rs. (x - 6)

   D. Rs. (x - 8)

Answer: D

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5. There are few males and females in a meeting . If $\dfrac{3}{8}$ of the people in the meeting are males and there are 90 more

females than male how many females are there in the meeting ?

A. 135

B. 200

C. 225

D. None of these

Answer: C

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6. A bacterial cell doubles itself after every 1 hour. How many cells will there be after 8 hours ?

A. 200 times of the original

B. 2^{10} times of the original

C. 2^8 times of the original

D. 2^6 times of the original

Answer: C

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7. Manpreet took part in an interschool race competition He cylcled 2.7 km, ran for $\dfrac{2}{3}$ hour and walked the remaining 500 m of the race. If the total distance of the race was 12 km, then find his running speed

A. 13.2 km/hr

B. 12 km/hr

C. 7.5 km/hr

D. 8.8 km/hr

Answer: A

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8. 200 persons had food provision for 48 days . If 40 persons left the place then the food will lasts for _____

    A. 60 days

    B. 120 days

    C. 40 days

    D. 80 days

Answer: A

9. The outer dimensions of a closed box are 15 cm by 13 cm by 10 cm . Thickness of the wood is 2 cm. Find the total cost of wood required to make the box if $1cm^3$ of wood costs Rs. 5.00

    A. Rs. 6780

    B. Rs. 2020

    C. Rs. 4880

    D. Rs. 8210

Answer: A

10. The results of a random survey showed that 22 out of 75 people are suffering from viral fever . Which is the best prediction of the total number of people suffering from fever, if there are 3000 people in a village ?

A. 2500

B. 500

C. 900

D. 2000

Answer: C

1. Read the given statements carefully and select the correct option

Statement - 1 : If the radii of two right circular cylinders are in the ration 1 : 2 and their height are in the ratio 4 : 3 then the ratio of their curved surface areas is 2 : 3

Statement - 2 : If each edge of a cube is doubled, then the surface area of the new cube will become three times

A. Statement - 1 is false but Statement - 2 is true

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

C. Both Statement - 1 and Statement - 2 are true

D. Both Statement - 1 and Statement - 2 are false

Answer: B

2. Fill in the blanks and select the correct option

(i) Product of a positive rational number with a P rational number is always negative

(ii) Multiplicative inverse of $\dfrac{1}{3^{-14}}$ is Q

(iii) The unit digit of the square of the number 1989 is R

(iv) If three acute angles of a quadrilateral measure $80°$ each , then the measure of the fourth angle is S

	P	Q	R	S
A.	Positive	3^{-14}	3	$140°$
B.	Negative	3^{-14}	3	$150°$
C.	Positive	3^{-14}	9	$110°$

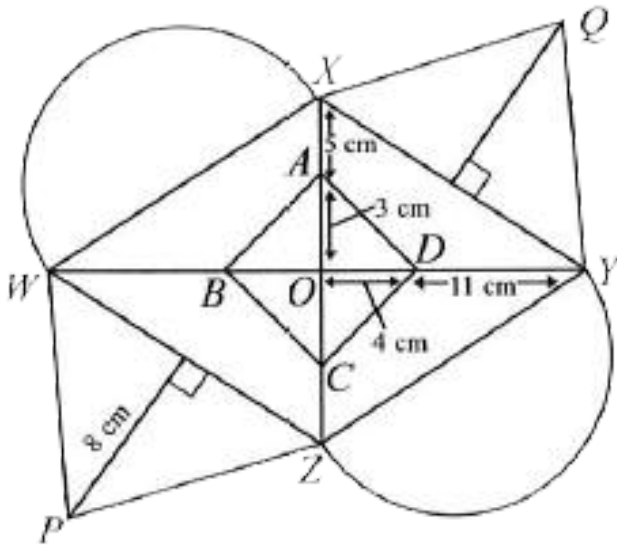|	P	Q	R	S
D.	Negative	3^{-14}	1	$120°$

Answer: D

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3. In the given figure (not drawn to scale), ABCD and WXYZ both are rhombus, 2 semi- circles and 2 identical triangles are drawn on the sides of rhombus WXYZ. Which of the

following options is correct ?

A. Area of $\triangle WPZ$ is 104 cm^2

B. Circumference of the semi - circle is 20 cm

C. Area of rhombus ABCD is 24 cm^2

D. None of these

Answer: C

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4. Read the given statements carefully and state 'T' for true of 'F' for false

(i) The compound interest on Rs 60000 for 3 years if the rate of interest is 5% for first year, 4% for second year and 3% for third year is Rs. 7485.60

(ii) If compound interest on a sum for 2 years is Rs. 832 and the simple interest on the same sum at the same rate for the same time period is Rs. 800 then the rate of interest is 12%

(iii) For a certain sum, if the simple interest for $3\frac{1}{2}$ years at 8% p.a. is Rs. 60 more than the simple interest for $2\frac{1}{2}$ years at 10% p.a. for the same sum, then the sum is Rs. 2000
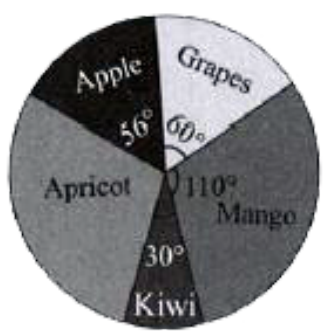
	(i)	(ii)	(iii)
A.	T	T	F

	(i)	(ii)	(iii)
B.	F	T	F
C.	T	F	T
D.	F	F	T

Answer: C

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5. The given pie chart shows the different types of fruits in a store. The total number of fruits in the store is 1080

If a fruit is selected at random, then

(a) Find the probability that the selected fruit is an Apricot

(b) Find the probability that the selected fruit is a Kiwi

A. $\quad$ (a) $\dfrac{19}{60}$ $\quad$ (b) $\dfrac{29}{60}$

B. $\quad$ (a) $\dfrac{17}{45}$ $\quad$ (b) $\dfrac{7}{22}$

C. $\quad$ (a) $\dfrac{13}{45}$ $\quad$ (b) $\dfrac{1}{12}$

D. $\quad$ (a) $\dfrac{23}{50}$ $\quad$ (b) $\dfrac{17}{40}$

Answer: C

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