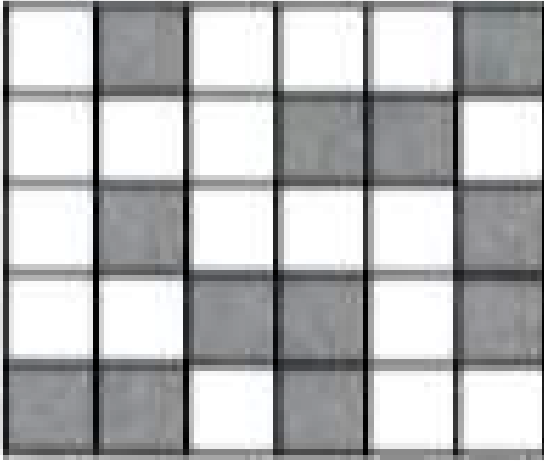# MATHS

BOOKS - HT Olympiad Previous Year Paper

IMO QUESTION PAPER 2020-21 SET A

Mathematical Reasoning

1. How many more squares must be shaded so that the given figure has 2/5 as unshaded
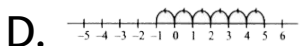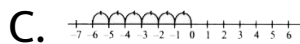
fraction?

A. 8

B. 6

C. 5

D. 7
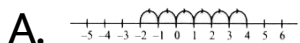
Answer: B

2. Which of the following number line represents 0-2-4?

A.

B.

C.

D.
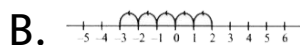
Answer: C

3. Which rational number has to be multiplied with 64 to get the product $-49\dfrac{3}{5}$?

A. $\dfrac{-35}{43}$

B. $\dfrac{-31}{40}$

C. $\dfrac{-33}{40}$

D. $\dfrac{-37}{43}$
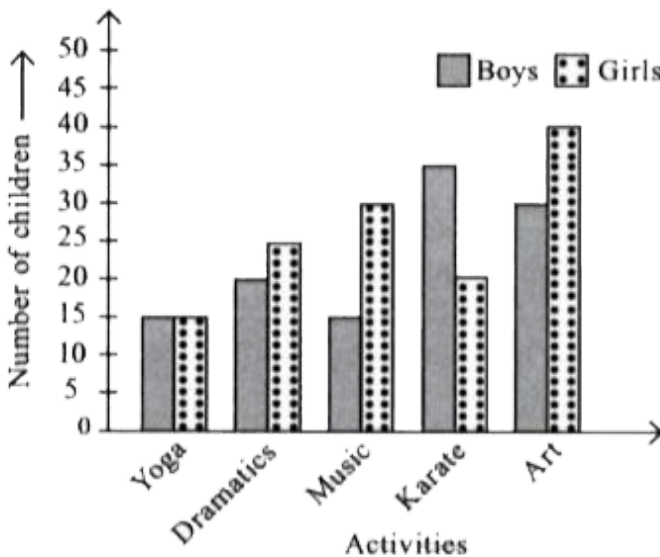
Answer: B

4. The given double bar graph shows the various activities taken up by the boys and girls in a particular group. Study the graph carefully and answer the following questions?

What is the diffeence between the average

number of boys and average number of girls taken all the activities together?

A. 10

B. 5

C. 3

D. 16

Answer: C

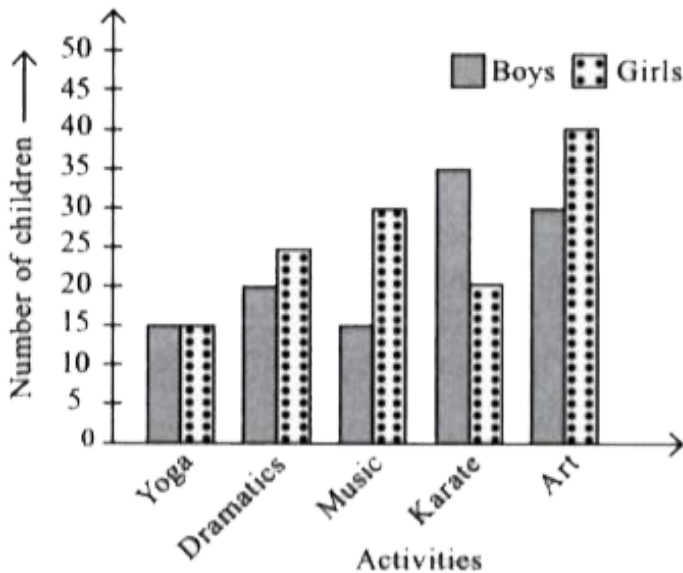▶ **Watch Video Solution**

5. The given double bar graph shows the various activities taken up by the boys and girls in a particular group. Study the graph carefully and answer the following questions?

Find the ratio of the number of boys taken

Music and Art together to the number of girls taken Yoga and Karate together:

A. $7:9$

B. $7:11$

C. $9:7$

D. $8:15$

Answer: C

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6. The value of

$$\frac{0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02}{0.4 \times 0.4 \times 0.4 + 0.08 \times 0.08 \times 0.08} \text{ is}$$

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

B. $\dfrac{1}{16}$

C. $\dfrac{1}{64}$

D. $\dfrac{1}{72}$

Answer: C

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7. Prism is a polyhedron whose base and top are _____.

A. Congruent

B. Similar

C. Propotional

D. Different

Answer: A

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8. In the figure (not drawn to scale) ABC is an equilateral triangle and ABD is an isosceles triangle with DA=DB, find the value of x.
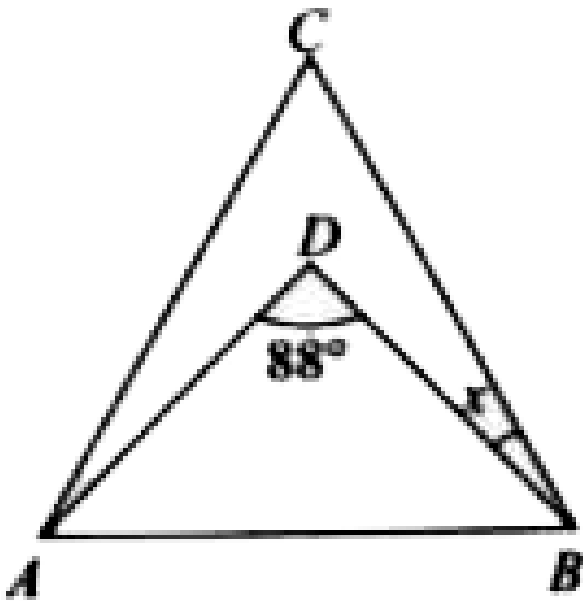
A. $14°$

B. $16°$

C. $12°$

D. $32°$

Answer: A

9. Solve: $\dfrac{1}{1 + x^{p-q}} + \dfrac{1}{1 + x^{q-p}}$

A. x^{pq}

B. $\dfrac{1}{x^{pq}}$

C. 1

D. x^{p-q}

Answer: C

10. If 7 is multiplied with 8 more than a number, it becomes the same as 3 is added to 15 times the same number. This fact can be represented as _____

A. $7(8+x) = 3x - 15$

B. $7x + 8 = 15x + 3$

C. $7(8 + x) = 15x + 3$

D. $7(8 - x) = 3x + 15$

Answer: C

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11. Which of the following staements is correct?

A. If lengths of any two sides of a triangle are 8 cm and 11 cm, then the length of its third side lies between 3 cm and 19 cm

B. It is possible to construct a unique triangle, if all its three angles are given.

C. An angle of $30°$ can' be constructed using compass and ruler.

D. A triangle can be constructed by taking two of its angles as $90°$ and $90°$

Answer: A

12. Subtract 18.569 from the sum of 208.056

and 48.685.

A. 215.640

B. 238.172

C. 198.642

D. 254.840

Answer: B

▶

13. What should be subtacted from $7a^3 + 6a^2 - 2 - 5a$ to get $4a^3 - 7a + 5a^2 + 8$?

A. $3a^3 + a^2 + 2a - 10$

B. $4a^3 - a^2 - 2a + 8$

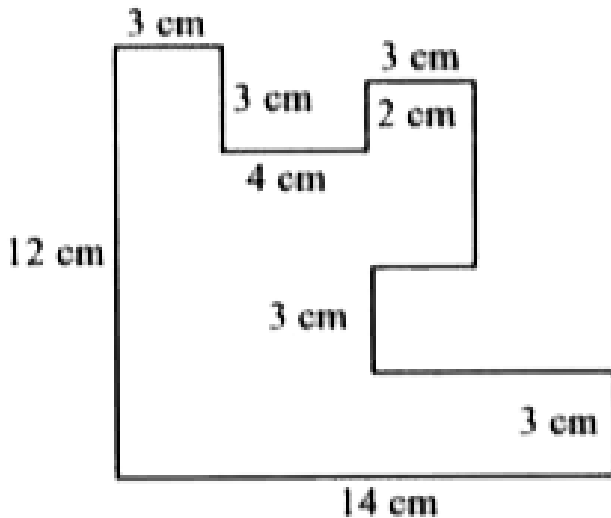C. $-2a^3 - a^2 + 3a - 4$

D. $3a^3 - 2a^2 + a - 5$

Answer: A

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

3 cm

3 cm

3 cm   2 cm

4 cm

12 cm

3 cm

3 cm

14 cm

A. $152cm^2$

B. $114cm^2$

C. $108cm^2$

D. $102cm^2$

Answer: C

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15. Which of the following options is incorrect?

A. x=5 is the soluion of $3x + 7 = 22$.

B. The equation $3x + 5 = 13$ represents 5

more than 3 times a number x gives 13.

C. The solution of the equation $5x - 8 = 2$

is x=2

D. The solution of the equation

$10 - 3x = 1$ is x=4

Answer: D

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16. Two numbers are in the ratio $7 : 11$. If 9 is

added to each of the numbers, then ratio

becomes 11:16. The numbers are _____

A. 28 and 44
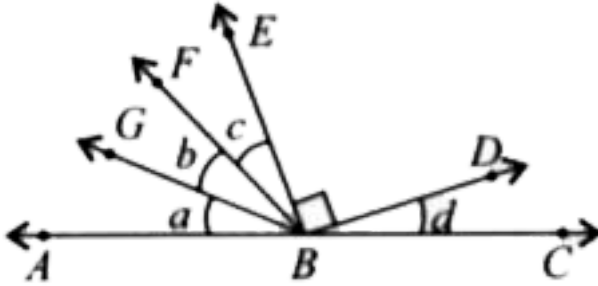
B. 22 and 32

C. 44 and 64

D. 35 and 55

Answer: D

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17. In the given figure (no drawn to scale) ABC is a straight line $\angle DBE$ is a right angle and

$\angle a = \angle b = \angle c = \angle d$. Find $\angle a$

A. 22.5°

B. 30°

C. 45°

D. 60°

Answer: A

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18. Which of the following figures do not have any line of symmetry?

A.

B.

C.

D.
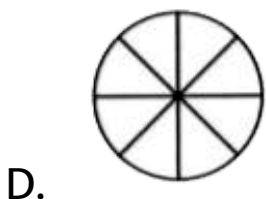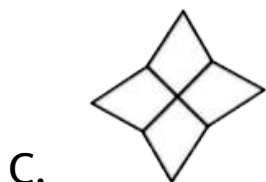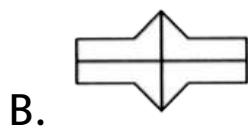
Answer: A

19. A bag conains 30 blue ribbons, 15 red ribbbons and 5 black ribbons. If a ribbon is drawn at random from the bag, then find the probability of getting a red ribbon.

A. 3/10

B. 5/12

C. 15/25

D. 2/11

Answer: A

20. Which of the following is greater than

16.3 % ?

    A. 163 out of 1000

    B. 113 out of 250

    C. 8 out of 50

    D. 39 out of 750

Answer: B

Everyday Mathematics

1. Four different bells beep after every 20 minutes, 40 minutes, 1 hour 20 minutes and 1 hour 40 minutes. If all bell rings (beeped) together at 5:00 a.m then they will again beep together at

A. 6 : 00 p.m.

B. 11 : 40 a.m

C. 12 : 00 noon

D. 9 : 0 p.m

Answer: B

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2. A man purchased 700 eggs. He found that 20% of them were broken. How many eggs were found broken?

A. 20

B. 70

C. 140

D. 35

Answer: C

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3. The dimensions of a garden are 45 m by 20

m. In the garden there is a square shaped

water pond with side 8m. Find the area of garden not including the water pond.

A. $714m^2$

B. $640m^2$

C. $836m^2$

D. $630m^2$

Answer: C

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4. Three students Varun, Katik and Sid wrote a statement on a blackboard.

Varun wrote, Two rectangles are congruent, if they have same perimeter.

Kartik wrote, Two squares are congruent, if they have same area.

Sid wrote, Two circles are congruent, if they have same diameter.

Who wrote the correct statement?

    A. Varun and Kartik

    B. Kartik and Sid

C. Varun and Sid

D. Varun, Kartik and Sid

Answer: B

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5. Every floor of a 96 storey skyscraper is 5m high. If a balloon rises 3 m every second, then how long will it take for the balloon to rise from 47th floor to 92nd floor?

A. 140 secs

B. 3 mins

C. 2 mins

D. 75 secs

Answer: D

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6. An NGO bought 145.6 kg of wheat at Rs. 11 per kg and distributes it equally amongst 110

people. What was the cost of the quantity of wheat that each person got?

A. Rs. 14.56

B. Rs. 18.50

C. Rs. 21.25

D. Rs. 25.60

Answer: A

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7. In an examination a student was asked to find $\dfrac{5}{17}$ of a certain number. By mistake he found $\dfrac{17}{5}$ of that number. If his answer was $\dfrac{264}{119}$ more than the correct answer then find the number.

A. $\dfrac{7}{5}$

B. $\dfrac{5}{7}$

C. $\dfrac{3}{7}$

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

Answer: B

8. The average height of 6 employees of a company is 152 cm. When an employee leaves the company, the new average becomes 156 cm. Find the height of employee who left the company.

A. 132cm

B. 138cm

C. 152cm

D. 140cm

Answer: A

9. Gaurav traveled $\left(p^2 - 4p + 2\right)$ kilomeres by car and $\left(2p^2 + 6p - 5\right)$ kilometres by bus. What is the total distance travelled by Gaurav?

A. $\left(p^2 + 2p - 3\right)$ km

B. $\left(3p^2 - 3p - 3\right)$ km

C. $(3p^2 + 2p - 3)\,\text{km}$

D. $3(p^2 - p - 1)\,\text{km}$

Answer: C

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10. A student has to score 40% of the maximum marks to pass. Ronak scored 85 marks and failed by 35 marks. Find the maximum marks.
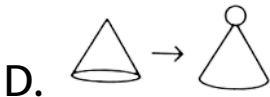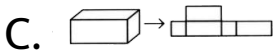
A. 450

B. 250
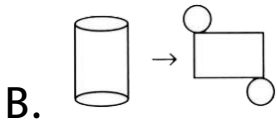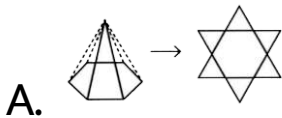
C. 400

D. 300

Answer: D

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Achievers Section

1. Which of the following options represents the incorrect match of the given 3-D figures and their nets?

A.

B.

C.

D.

Answer: C

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2. Read the statements carefully and select the correct option.

Statement I: The line segment joining a vertex of a triangle to the mid point of its opposite side called the median of the triangle.

Statement II: If the exterior angle of a tiangle is a right angle, then each opposite interior angle is an obtuse angle.

    A. Both Statement -I and Statement -II are

        true.

B. Both Statement -I and Staement -II are

false.

C. Statement -I is true but Statement -II is

false.

D. Statement -I is false but Statement -II is

true.

Answer: C

3. Read the given statements carefully and state T for true and F for false.

(i) If the simple interest on a sum is equal to the principal and number of years is equal to the rate percent per annum, then rate of interest is 10% per annum.

(ii) I a person purchases 12 items for Rs. 36 and sells 10 items for Rs. 36, then the profit % is 15%.

(iii) The percentage decrease in the priceof a shirt when it decreased from Rs. 4000 to Rs. 2500 is 15%.

	i	ii	iii
A.	T	T	F
B.	T	F	F
C.	F	T	F
D.	F	F	T

Answer: B

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4. Match the following and select the correct option.

Column I		Column II
(P) $\dfrac{7}{-18}+\dfrac{(-5)}{12}+\dfrac{(-9)}{(-16)}=$	(i)	$14\dfrac{9}{10}$
(Q) If $\left(\dfrac{1}{3}+\dfrac{1}{4}-\dfrac{1}{5}\right)+x=4,$ then $x=$	(ii)	$\dfrac{2}{9}$
(R) Divide the sum of $\dfrac{12}{5}$ and $\dfrac{13}{7}$ by the product of $-\dfrac{4}{7}$ and $-\dfrac{1}{2}$	(iii)	$-\dfrac{35}{144}$
(S) Additive inverse of $-\dfrac{5}{9}+\dfrac{1}{3}$ is _____	(iv)	$3\dfrac{37}{60}$

A. `Ptoii,Qtoi,Rtoiv,Stoiii

B. Ptoiii,Qtoiv,Rtoi,Stoii

C. Ptoiii,Qtoi,Rtoiv,Stoii

D. Ptoii,Qtoiii,Roiv,Stoi

Answer: B

5. The runs scored by a player in 15 matches are as follows:

55,40,38,45,52,80,85,72,90,88,76,71,65,52,66

Find

a. Mean

b. Median

c. Mode

A.
a	b	c
65	66	52

B.
a	b	c
60	66	50

C.
a	b	c
65	72	52

D.
a	b	c
60	68	45

Answer: A

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