

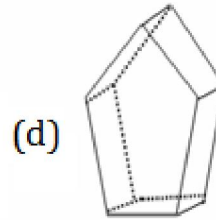
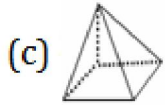
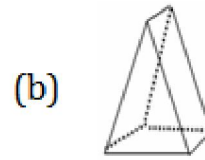
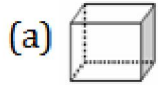


(d) 8 vertices, 6 edges, 4 flat surfaces.

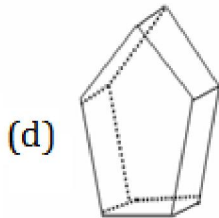
**Sol: (a)**

8 vertices, 12 edges and 6 flat surfaces

4. Which 3-dimensional figure has 7 faces, 15 edges and 10 vertices?



**Sol:**



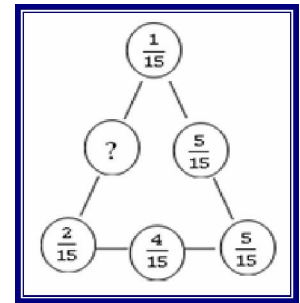
5. What should be placed in the empty space '?' so that the sum of fractions on each side of the triangle is same?

(a)  $\frac{7}{15}$

(b)  $\frac{9}{15}$

(c)  $\frac{6}{15}$

(d)  $\frac{8}{15}$



**Sol: (d)**

$$\frac{1}{15} + \frac{5}{15} + \frac{5}{15} = \frac{1}{15} + ? + \frac{2}{15}$$

$$\frac{11}{5} - \frac{3}{15} = ?$$

$$\frac{8}{15} = ?$$

6.  $xy - [yz - zx - \{yx - (3y - xz) - (xy - zy)\}]$

(a)  $xy - 3y + 2xz$

(b)  $xy + 3y + 2xz$

(c)  $-xy + 3y + 2xz$

(d)  $xy - 3y - 2xz$

**Sol: (a)**

$$xy - [yz - zx - \{yx - 3y + xz - xy + zy\}]$$

$$xy - [yz - zx + 3y - xz - zy]$$

$$xy - 3y - 2xz$$

7. In the word **Mathematics**, the ratio of number of consonants to the number of vowels is

(a) 4:7

(b) 7: 4

(c) 5:6

(d) 6:5

**Sol: (b)**

7:4

8. Which of the following correctly shows 185367249 according to International place value chart?

(a) 1, 853, 672, 49

(b) 18, 536, 724, 9

(c) 185, 367, 249

(d) None of these

**Sol: (c)**

185, 367, 249

9. Roman numeral for the greatest three digit number is

(a) IXIXIX

(b) CMXCIX

(c) CMIXIX

(d) CMIIC

**Sol: (b)**

CMXCIX

10. Which list shows the numbers in order from least to greatest?

(a) 3, 800, 902

3, 808, 290

4, 808, 092

4, 880, 901

(b) 4, 880, 901

4, 808, 092

3, 808, 290

3, 800, 902

(c) 4, 808, 092

3, 808, 290

4, 880, 901

3, 800, 902

(d) 3, 880, 902

4, 808, 092

3, 808, 290

4, 880, 901

**Sol: (a)**

3, 800, 902    3, 808, 290    4, 808, 092    4, 880, 901

**11.** On field day, Nitin jumped  $4\frac{7}{12}$  feet and Anil jumped  $3\frac{1}{6}$  feet. How much farther did

Nitin jump than Anil?

(a) 2 feet

(b)  $1\frac{5}{6}$  feet

(c)  $1\frac{5}{12}$  feet

(d)  $\frac{5}{12}$  feet

**Sol: (c)**

$$\begin{aligned} 4\frac{7}{12} - 3\frac{1}{6} &= \frac{55}{12} - \frac{19}{6} \\ &= \frac{55-38}{12} = \frac{17}{12} = 1\frac{5}{12} \end{aligned}$$

**12.** If  $GH = BC$ ,  $AJ = 2DE$ ,  $JI = \frac{1}{2} AB$ ,  $IH = CD + DE + GH$ .

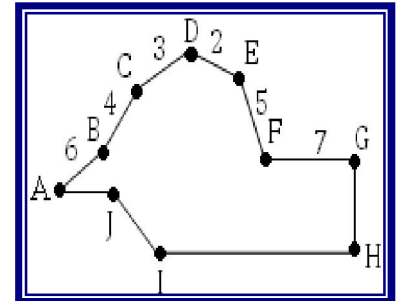
The Perimeter of the given figure is

(a) 47 units

(b) 50 units

(c) 43 units

(d) 41 units



**Sol: (a)**

47 units

**13.** Who is the father of Geometry ?

(a) Pythagoras

(b) Thales

(c) Archimedes

(d) Euclid.

**Sol: (d)**

Euclid

**14.** A milkman mixes 20 liters of water with 80 liters of milk. After selling one-fourth of this mixture he adds water to replenish the quantity that he has sold. What is the current proportion of water to milk?

(a) 3:2

(b) 2:3

(c) 3: 4

(d) 4:5

**Sol:** (b)

Total Mixture = 20 + 80 = 100 litres

Sold mixture =  $\frac{1}{4} \times 100 = 25$  litres

Replusing mixture = 75 litres

$\therefore$  Added water = 25 litres.

water mixed in 100 litres mixture = 20 litres

water mixed in 75 litres mixture =  $\frac{20}{100} \times 75 = 15$  litres

Total water added = 25 + 15 = 40

Total mixture = 100

$\therefore$  Milk = 100 - 40 = 60.

$\therefore$  Water Milk = 40 : 60 = 2 : 3

**15.** In the new budget, the price of a petrol rose by 10%, the percent by which one must reduce the consumption so that the expenditure does not increase is :

(a)  $6\frac{1}{9}\%$

(b)  $6\frac{1}{4}\%$

(c)  $9\frac{1}{11}\%$

(d) 10%

**Sol:** (c)

Let price of petrol = Rs x

price hike = 10%

i.e.  $\frac{10}{100} \times x = \frac{x}{10}$

New price =  $x + \frac{x}{10} = \frac{11x}{10}$

earlier consumption = y litra

earlier investment =  $xy$ .

A.T.Q.,

Present investment = previous investment

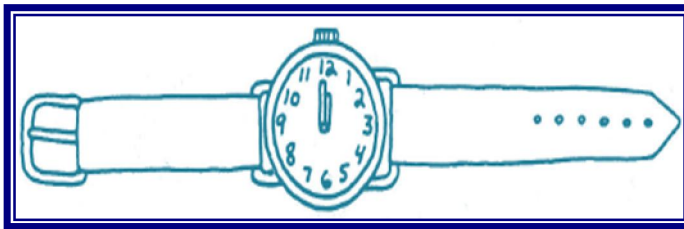
$$\left(\frac{11x}{10}\right) (\text{present petrol consumption}) = xy$$

$$\text{present petrol consumption} = (xy) \times \frac{10}{11x} = \frac{10y}{11}$$

$$\text{Reduction in consumption} = y - \frac{10y}{11} = y/11$$

$$\% \text{ age} = \frac{y/11 \times 100}{y} = \frac{100}{11} = 9\frac{1}{11}\%$$

- 16.** Watch out for this wristwatch. It's all wound up – but it's headed in the wrong direction! At 12:00 it always shows the correct time. Then its hands move to the left instead of the right. See if you can figure out what time it is when the watch shows the times 8:30



(a) 8.30

(b) 3.30

(c) 5.30

(d) 4.30

**Sol:** (b) 3.30

- 17.**  $a \times (b + c) = a \times b + a \times c$ , the property is

(a) associative

(b) commutative

(c) distributive

(d) anti-commutative

**Sol:** (c) distributive

- 18.** Like dozen is 12 articles, What is “score” equals to

(a) 20

(b) 30

(c) 24

(d) 36

**Sol:** (a) 20



**22.** A school bus travels from Delhi to Chandigarh. There are 4 children, 1 teacher and 1 driver in the bus. Each child has 4 backpacks with him. There are 4 dogs sitting in each backpack and every dog has 4 puppies. What is the total number of eyes in the bus?

(a) 256 (b) 128

(c) 657 (d) 652

**Sol:** (d)

No. of teacher = 1

No. of driver = 1

eyes of teacher and driver =  $(1+1) \times 2 = 4$

No. of children = 4

eyes of children =  $4 \times 2 = 8$

No. of dogs in each backpack =  $4 \times 4 = 16 \times 4 = 64 \times 2 = 128$  eyes

eyes of puppies =  $64 \times 4 = 256 \times 2 = 512$  eyes

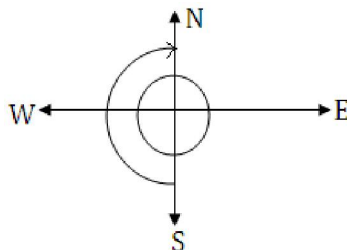
Total eyes =  $4 + 8 + 128 + 512 = 652$  eyes

**23.** The direction in which you reach, if you move from South and take one and a half revolution clockwise

(a) West (b) East

(c) South (d) North

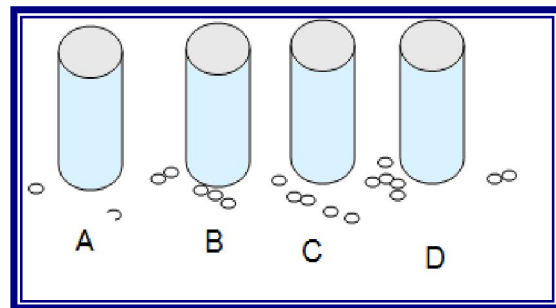
**Sol:** (d) North





24. Consider the following steps regarding the beans.

1. Fill cup A with beans.
2. Pour half of the beans from cup A into cup B.
3. Pour half of the beans from cup B into cup C.
4. Pour half of the beans from cup A into cup C.
5. Pour all of the beans from cup A into cup D.
6. Pour half of the beans from cup C into cup A.



Which cup contains the most beans now?

(a) cup C

(b) cup B

(c) cup D

(d) All cups have equal

**Sol:** (d)

	A	B	C	D
Step 1.	50	50	0	0
Step 2.	50	25	25	0
Step 3.	25	25	50	0
Step 4.	0	25	50	25
Step 5.	25	25	25	25

25. Tell the number of triangles in the following figures

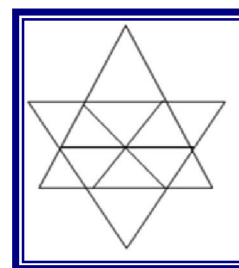
(a) 20

(b) 25

(c) 18

(d) 15

**Sol:** (a) 20





$$\frac{x}{100} \times y + \frac{y}{100} \times x$$

$$= \frac{2xy}{100} = \frac{2}{100} \times xy$$

**29.** In an examination, a student scores 4 marks for every correct answer and loses 1 mark for every wrong answer. If he attempts all 75 questions and secures 125 marks, the number of questions he attempted correctly, is

- (a) 35 (b) 40  
(c) 42 (d) 46

**Sol:(b)**

If the number of correct answer be  $x$ , then the number of incorrect answer is  $(75 - x)$ .

$$\therefore 4x(75 - x) = 125 \text{ or } x = 40$$

**30.** Calculate the size of angle  $y$  in the adjoining figures :

- (a)  $27^\circ$  (b)  $43^\circ$   
(c)  $23^\circ$  (d)  $60^\circ$

**Sol: (c)**

$$x + y = 60^\circ \quad (\text{alternate angle})$$

$$y + z = 143 \quad (\text{alternate angle})$$

$$x + y + z = 180^\circ \quad (\text{linear pair})$$

$$60 + z = 180$$

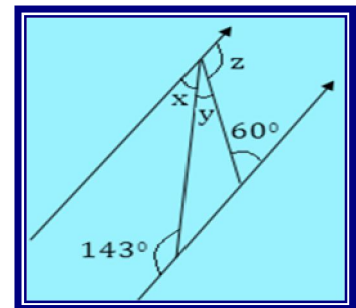
$$z = 180^\circ - 60^\circ$$

$$= 120^\circ$$

$$y + 120^\circ = 143^\circ$$

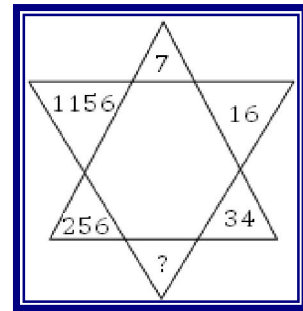
$$y = 143^\circ - 120^\circ$$

$$= 23^\circ$$



31. The missing number (?) is

- (a) 72 (b) 49  
(c) 68 (d) 66



**Sol: (b)**

$$(34)^2 = 1156$$

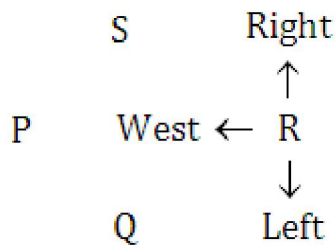
$$16 = 256$$

$$(7)^2 = 49$$

32. P, Q, R and S are playing carom game. P, R and S, Q are partners. S is to the right of R who is facing west. Then Q is facing what direction?

- (a) North (b) south  
(c) East (d) West

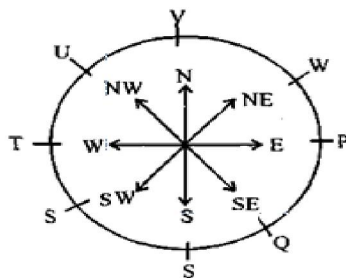
**Sol: (d)**



33. P, Q, R, S, T, U, V, W are sitting around a round table in the same order, for group discussion at equal distance. Their position is clockwise. If V sits in the north, then what will be the position of S?

- (a) East (b) South-east  
(c) South (d) South-west

**Sol: (d)** Clearly, the seating arrangement is as shown in the adjoining figure. So, S is at the south- west position



**34.** Ravi is not wearing white and Ajay is not wearing blue. Ravi and sohan wear different colour. Sachin alone wear red. What is sohan coloured, if all four them are wearing different colour.

(a) red

(b) blue

(c) white

(d) can't say

**Sol:(d)**

The fourth colour and some more information are required

**35.** How many times in a day, those of two hands of a clock coincide?

(a) 11

(b) 12

(c) 22

(d) 24

**Sol: (c)**

22

### Section-C {for 8<sup>th</sup> only}

36. Number by which 19602 be divided, So that the quotient is a perfect square is

- (a) 2 (b) 9  
(c) 3 (d) 4

**Sol:** (a)

Let us start from 1<sup>st</sup> option

$$\begin{aligned}\frac{19602}{2} &= 9801 \\ &= 7 \times 7 \times 7 \times 7 \\ &= (49)^2\end{aligned}$$

37. If  $x + \frac{1}{x} = 4$ , then the value of  $x^2 + \frac{1}{x^2}$  is

- (a) 12 (b) 16  
(c) 14 (d) 20

**Sol:** (c)

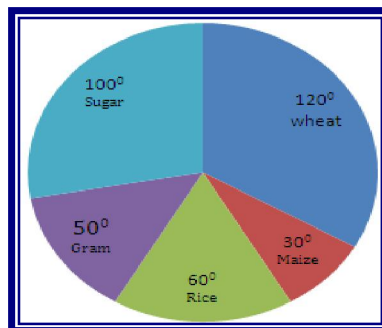
$$x + \frac{1}{x} = 4$$

$$\left(x + \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} + 2x \cdot \frac{1}{x}$$

$$(4)^2 = x^2 + \frac{1}{x^2} + 2 = 16 - 2 = 14$$

38. The pie chart given below shows the annual agricultural production of an Indian state. If the total production of all the commodities is 81000 tonnes, then production of rice and sugar respectively is

- (a) 22500, 13500  
(b) 13500, 22500  
(c) 13500, 27000  
(d) 27000, 22500



**Sol: (b)**

$$\text{Production of rice} = \frac{60}{360} \times 81000 = 13500$$

$$\text{Production of sugar} = \frac{100}{360} \times 81000 = 22500$$

**39.** The sum of the powers of the prime factors in  $108 \times 192$  is

(a) 5

(b) 7

(c) 8

(d) 12

**Sol: (d)**

$$108 \times 192$$

$$(2 \times 2 \times 3 \times 3 \times 3) \times (2 \times 2 \times 2 \times 2 \times 2 \times 3)$$

$$(2^2 \times 3^3) \times (2^6 \times 3^1)$$

$$2^8 \times 3^4 = \text{sum of powers} = 8 + 4 = 12$$

**40.** The factors of  $x^4 + y^4 + x^2y^2$  are

(a)  $(x^2 + y^2)(x^2 + y^2 - xy)$

(b)  $(x^2 + y^2)(x^2 - y^2)$

(c)  $(x^2 + y^2 + xy)(x^2 + y^2 - xy)$

(d) Factorization is not possible

**Sol: (c)**

$$x^4 + y^4 + x^2y^2$$

$$(x^2)^2 + (y^2)^2 + 2x^2y^2 - x^2y^2$$

$$(x^2 + y^2)^2 - (xy)^2$$

$$(x^2 + y^2 - xy)(x^2 + y^2 + xy).$$

**41.** The number which is exactly divisible by 99 is

(a) 3572404

(b) 135792

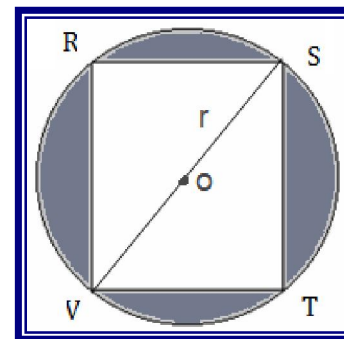
(c) 913464

(d) 114345

**Sol: (d)**

$$114345$$

42. In the given figure, RSTV is square inscribed in a circle with centre O and radius r. The total area of shaded region is \_\_\_\_\_.



(a)  $r^2 (\pi - 2)$

(b)  $2r^2(2 - \pi)$

(c)  $\pi (r^2 - 2)$

(d)  $8r^2 - 8r$

**Sol: (a)**

Let side of square = x

$$x^2 + x^2 = (2r)^2$$

$$2x^2 = 4r^2$$

$$x^2 = 2r^2$$

$$x = \sqrt{2} r$$

$$\text{Area of square} = (\sqrt{2} r)^2 = 2r^2$$

$$\text{shaded Area} = \pi r^2 - 2r^2 = r^2(\pi - 2).$$

43. A is the father of C and D is the son of B. E is the brother of A. If C is the sister of D, how is B related to E?

(a) Daughter

(b) Brother-in-law

(c) Husband

(d) Sister-in-law

**Sol: (d)**

A is the father of C and C is the sister of D means A is the father of D. Since D is the son of B so B is the mother of D and wife of A. Also, E is the brother of A so B is the sister-in-law of E.

44. The perimeter of a square is twice the perimeter of a circle and their areas are AS and AC respectively then

(a)  $AS > AC$

(b)  $AC > AS$

(c)  $AS = 2AC$

(d)  $AS = AC$

**Sol: (a)**

$$4 \times \text{side} = 2 (2 \pi r)$$

$$\text{side} = \pi r$$



$$\text{Area of circle} = \pi r^2$$

$$\text{Area of square} = (\text{side})^2 = (\pi r)^2 = \pi^2 r^2$$

AS > AC

45. Two poles, 15 m and 30m height, stand upright in a playground. If their feet be 36m apart. The distance between their tops is :

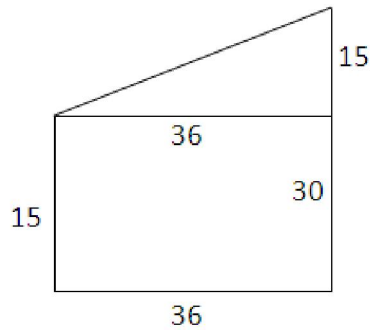
(a) 21 m

(b) 39 m

(c) 41 m

(d) 36m

**Sol: (b)**



$$\text{Distance between tops} = \sqrt{(36)^2 + (15)^2}$$

$$= \sqrt{1296 + 225} = \sqrt{1521} = 39$$

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