



## CREST EduFund Mental Maths Olympiad (CEMMO)

# Sample Paper

## Pattern and Marking Scheme

Grade	Topic/Section	No. of Questions	Marks per Question	Total Marks
Grade 5	Basique	80	3	240
	Avance	20	6	120
<b>Grand Total</b>		<b>100</b>		<b>360</b>

The total duration of the exam is 60 minutes.

**Note:** For every incorrect answer, there's a penalty of  $\frac{1}{3}$  rd of the total marks allotted to that question.

## Syllabus

### Knowing Our Numbers

- System of numeration
- Comparison of numbers
- Estimation of numbers and place value of a number
- BODMAS rule
- Whole numbers
- Properties of whole numbers

### Integers

- Integers
- Addition and subtraction of integers on number line
- Properties of integers over addition, subtraction, multiplication, division

### Fractions and Decimals

- Fractions: Operations and types
- Ascending and descending order of the fractions
- Decimals and their place values
- Operations on decimals

- e. Decimal fractions
- f. Ascending and descending order of the decimals

## **Playing With Numbers**

- a. Factors and multiples
- b. Prime numbers
- c. Composite numbers
- d. Divisibility rules
- e. Prime factorization
- f. H.C.F. and L.C.M.
- g. Play with patterns

## **Understanding Elementary Shapes**

- a. Lines and angles
- b. Classification of triangles, circle & quadrilateral
- c. Polygons
- d. 3D shapes

## **Mensuration**

- a. Perimeter of rectangle
- b. Perimeter of square
- c. Perimeter of triangle
- d. Perimeter of closed figures
- e. Area of rectangle, square and combined figures

## **Data Handling and Symmetry**

- a. Pictographs, line graph and bar graph
- b. Symmetry - Point & Reflection

## **Comparing Quantities**

- a. Percentage
- b. Speed, time and distance
- c. Profit and loss
- d. Problems on ages
- e. Average
- f. Ratio and proportion

For more details, visit <https://www.crestolympiads.com/mental-maths-mmo>

## Basique (Each Question is 3 Marks)

- Write in numeral:  
One hundred and sixteen million, One hundred and ten thousand, and thirty-nine
  - 113,128,138
  - 116,110,039
  - 122,313,987
  - 126,871,873
- What is the difference between Ninety thousand, four hundred and ten to Nine hundred and twenty thousand, four hundred and four in numeral?
  - 829994
  - 839200
  - 845600
  - 855700
- What digit is in the hundredths place?  
2463.3475
  - 3
  - 4
  - 5
  - 7
- What is the total sum of natural numbers within the range of 1 and 100?
  - 2340
  - 3450
  - 4560
  - 5050
- In a survey, it was found that  $\frac{2}{3}$  of the people prefer coffee over tea. If there were 150 respondents, how many people preferred coffee?
  - 80
  - 100
  - 120
  - 140
- Which of the following numbers is divisible by 12?
  - 48062
  - 27568
  - 27296
  - 27840
- Lena wants to divide a piece of ribbon into equal-length pieces. If she wants each piece to be 12 cm long, but her ribbon is only 180 cm long, what is the greatest number of pieces she can cut?
  - 12
  - 13
  - 14
  - 15
- Sharon's height is 145.62 cm. She stands on a stool of height 10.50 cm. What is the combined height now?
  - 149.16 cm
  - 156.12 cm
  - 163.54 cm
  - 171.67 cm

- 9.** How many prime numbers are between 11 and 60?
- a. 12    b. 14  
c. 16    d. 18
- 10.** If a shirt is on sale for 20% off its original price of \$50, what is the sale price?
- a. \$40    b. \$42  
c. \$44    d. \$46
- 11.** If a company has 200 employees and 25% of them are part-time, how many part-time employees does it have?
- a. 20    b. 30  
c. 40    d. 50
- 12.** Anni's current age is 7 years more than Sofia age. In 10 years, Anni age will be twice the age Sofia was 15 years ago. What is Sofia's present age?
- a. 50 years                                      b. 53 years  
c. 55 years                                      d. 57 years
- 13.** What is the average of first four multiple of 8?
- a. 24576                                      b. 25567  
c. 26675                                      d. 28954
- 14.** Identify the sequence which is in decreasing order?
- a.  $14.3506 > 14.3504 > 14.3497 > 14.3496$     b.  $14.3506 > 14.3496 > 14.3497 > 14.3504$   
c.  $14.3497 > 14.3496 > 14.3506 > 14.3504$     d.  $14.3497 > 14.3496 > 14.3504 > 14.3506$
- 15.** What is one less than a hundred thousand?
- a. 88888                                      b. 99990  
c. 99909                                      d. 99999
- 16.** Which of the following is the smallest number?  
1856, 1937, 1872, 1928
- a. 1872    b. 1928  
c. 1856    d. 1937
- 17.** How many times does the digit 0 appear in one million?
- a. 6    b. 3  
c. 5    d. 2

18. Which of the following pairs is not correct?

- a. Four thousand sixteen - 4016
- b. Two thousand two - 2002
- c. Nine thousand ninety - 9019
- d. Six thousand fifteen - 6015

19. How many whole numbers are there between 81 and 101?

- a. 18
- b. 17
- c. 19
- d. 21

20. Find the missing number:

$$\underline{\hspace{2cm}} \times (170 + 35) = 50 \times 170 + \underline{\hspace{2cm}} \times 35$$

- a. 35
- b. 50
- c. 170
- d. 30

21. Which is the smallest integer greater than all the negative integers?

- a. 0
- b. 1
- c. -1
- d. 2

22. How many times will you add 17 to get 187?

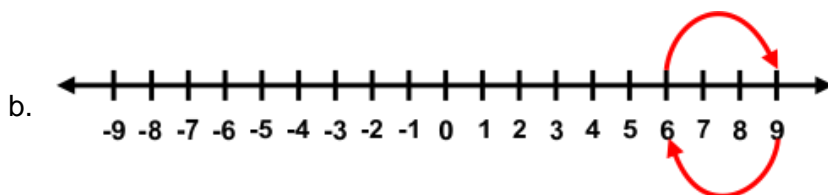
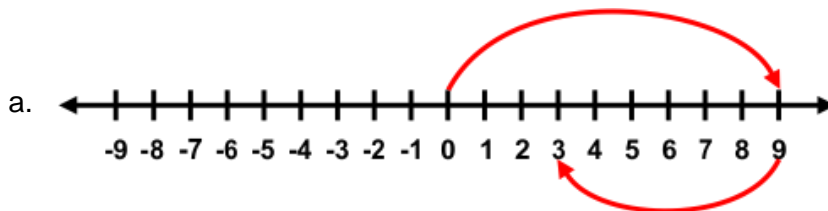
- a. 11
- b. 14
- c. 21
- d. 16

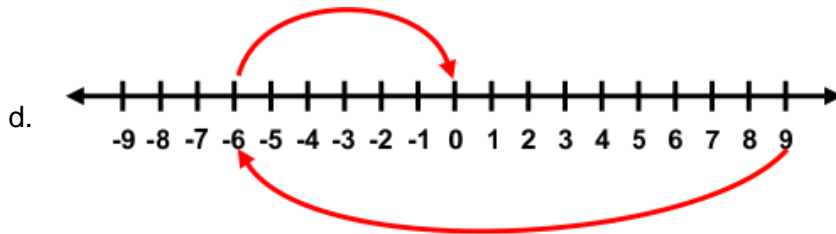
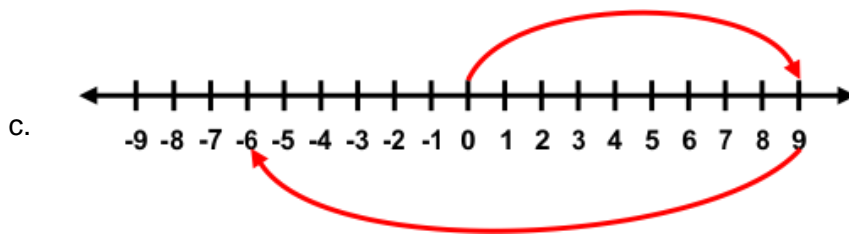
23. If a number is added to -8, the result is -2. What is the number?

- a. -6
- b. -3
- c. 6
- d. 4

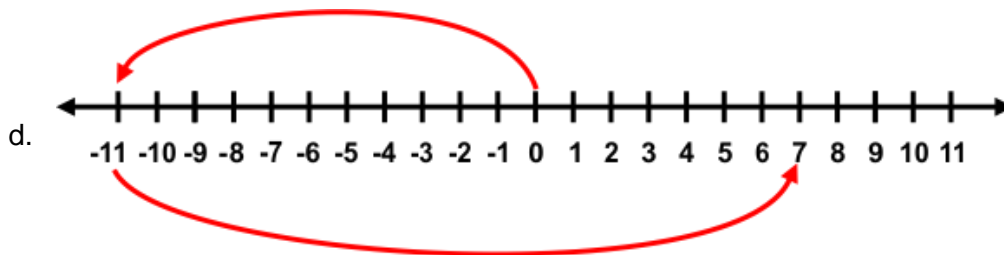
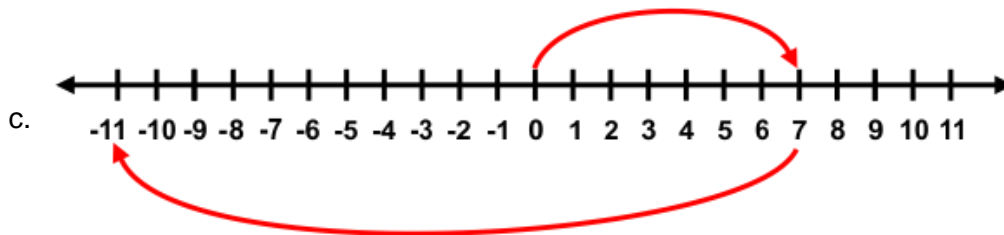
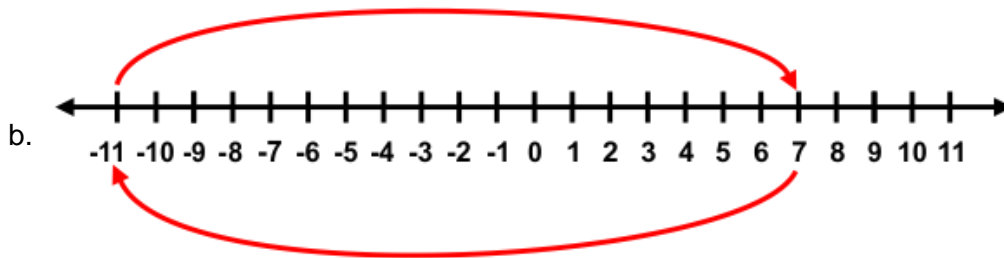
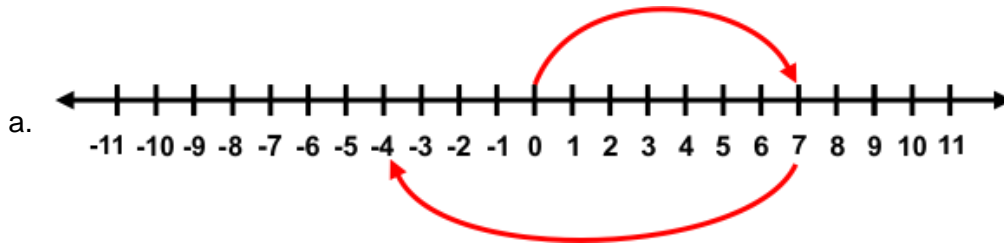
24. Use a number line and add the following integers:

$$9 + (-6)$$





25. Use number line and add the following integers:  
 $7 + (-11)$



26. Add:  
15 and (-20)

- a. -5  
b. -10  
c. 20  
d. 15

27. Find:  
 $25 \times 35 = (25 \times 30) + (25 \times \underline{\quad})$

- a. 5  
b. 3  
c. 6  
d. 4

28. Fill in the blank with correct number:

$$\frac{85}{12} = 7 \frac{1}{\square}$$

- a. 13  
b. 15  
c. 7  
d. 12

29. Convert  $\frac{5}{7}$  in the form of a fraction having 49 as the denominator.

- a.  $\frac{25}{49}$   
b.  $\frac{35}{49}$   
c.  $\frac{5}{49}$   
d.  $\frac{30}{49}$

30. Arrange the following fractions in decreasing order of magnitude. Use symbols to indicate the result:

$$\frac{9}{25}, \frac{12}{25}, \frac{23}{25}$$

- a.  $\frac{9}{25} > \frac{12}{25} < \frac{23}{25}$   
b.  $\frac{9}{25} > \frac{12}{25} > \frac{23}{25}$   
c.  $\frac{9}{25} < \frac{12}{25} < \frac{23}{25}$   
d.  $\frac{9}{25} > \frac{12}{25} = \frac{23}{25}$

31. Arrange the decimals in ascending order:

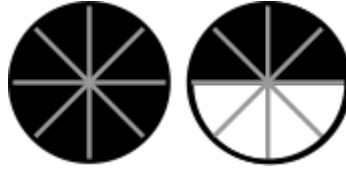
0.2, 0.12, 0.35, 0.72

- a. 0.12, 0.72, 0.35, 0.2  
b. 0.72, 0.35, 0.2, 0.12  
c. 0.12, 0.2, 0.35, 0.72  
d. 0.12, 0.2, 0.72, 0.35

32. What is nine thousandth in decimal form?

- a. 0.009
- b. 0.09
- c. 0.9
- d. 0.0009

33. Write the following fraction in decimal form.



- a. 2
- b. 1.9
- c. 2.2
- d. 1.5

34. 1 metre equals 39.37 inches; how many inches are there in 12 metres?

- a. 472.44
- b. 470.2
- c. 483.2
- d. 480.2

35. Write all the factors of 36.

- a. 1, 2, 3, 6, 9, 18, 23
- b. 1, 23
- c. 1, 2, 3, 4, 6, 9, 12, 18, 36
- d. 0, 2, 3, 4, 8, 12, 36

36. What is the smallest common multiple of 3 and 4?

- a. 12
- b. 15
- c. 16
- d. 18

37. Below 10, there are \_\_\_\_\_ prime numbers.

- a. 3
- b. 6
- c. 4
- d. 8

38. How many prime numbers are there which are less than 30?

- a. 10
- b. 30
- c. 50
- d. 20

39. Which of the following number are divisible by 6?

3277, 9582, 34646, 63587

- a. 9582
- b. 3277
- c. 34646
- d. 63587



40. What is the prime factorisation of 100?

- a.  $2 \times 2 \times 5 \times 5$
- c.  $2 \times 2 \times 3 \times 5$

- b.  $2 \times 2 \times 2 \times 5 \times 5$
- d.  $2 \times 5 \times 5 \times 5$

41. What is the prime factorisation of 342?

- a.  $2 \times 3 \times 3 \times 3 \times 19$
- c.  $2 \times 2 \times 3 \times 3 \times 19$

- b.  $2 \times 3 \times 3 \times 19$
- d.  $2 \times 3 \times 3 \times 19 \times 19$

42. Which smallest number leaves in each case the remainder 6 when it is divided by 16, 24, 32, 40?

- a. 386
- c. 486

- b. 286
- d. 586

43. Which smallest number is exactly divisible by 18, 24, 30, 36?

- a. 860
- c. 680

- b. 380
- d. 360

44. Find the L.C.M. of 76, 95.

- a. 280
- c. 760

- b. 300
- d. 380

45. What comes next in the given series?

5, 9, 13, 17, \_\_\_\_\_.

- a. 19
- c. 23

- b. 21
- d. 20

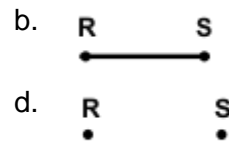
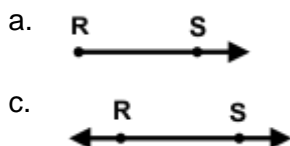
46. What comes next in the given series?

121, 232, 343, \_\_\_\_\_.

- a. 545
- c. 453

- b. 454
- d. 455

47. Which of the following option represent ray RS correctly?



48. A line segment is 8 cm long and is divided into 4 equal parts. What is the length of each part?

- a. 4
- b. 8
- c. 3
- d. 2

49. How many right angles make  $180^\circ$ ?

- a. Two
- b. Zero
- c. One
- d. Three

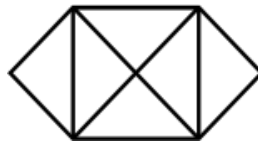
50. What is the angle name for one complete revolution?

- a. Acute angle
- b. Obtuse Angle
- c. Complete Angle
- d. Zero Angle

51. Two lines are said to be perpendicular to each other when they meet at \_\_\_\_\_ angle.

- a.  $90^\circ$
- b.  $360^\circ$
- c.  $270^\circ$
- d.  $180^\circ$

52. How many triangles are there in the following figures?

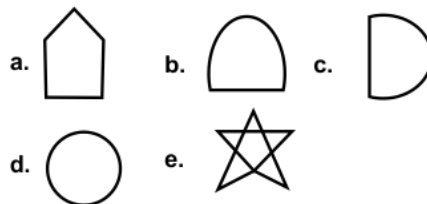


- a. 13
- b. 14
- c. 10
- d. 11

53. What is the sum of the interior angle of a quadrilateral?

- a.  $270^\circ$
- b.  $180^\circ$
- c.  $90^\circ$
- d.  $360^\circ$

54. Which of the following are polygons?

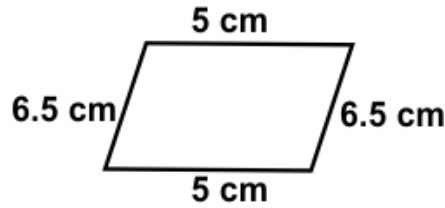


- a. a, e
- b. d, b
- c. c, a
- d. b, e

55. A 3D shape with one circular face and one flat face is called:

- a. cylinder
- b. cone
- c. rectangle
- d. prism

56. Find the perimeter of the given figure:

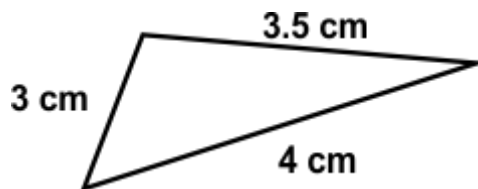


- a. 25 cm
- b. 6.5 cm
- c. 10 cm
- d. 23 cm

57. Find the perimeter of the rectangle whose sides are 5 cm and 2 cm:

- a. 9.5 cm
- b. 14 cm
- c. 10 cm
- d. 11 cm

58. Find the perimeter of the given triangle:

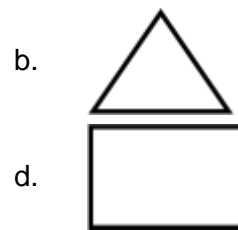
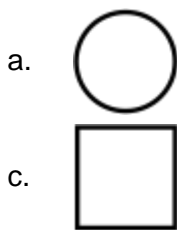


- a. 10.2 cm
- b. 10 cm
- c. 10.5 cm
- d. 10.4 cm

59. Find the cost of fencing a square park of side 120 m at the rate of \$4 per metre.

- a. \$1,920
- b. \$1,900
- c. \$1,980
- d. \$1,960

60. Which figure has a greater area?



61. The area of a triangle with a base 6 cm and a height 4 cm is:

- a.  $14 \text{ cm}^2$
- b.  $12 \text{ cm}^2$
- c.  $24 \text{ cm}^2$
- d.  $36 \text{ cm}^2$

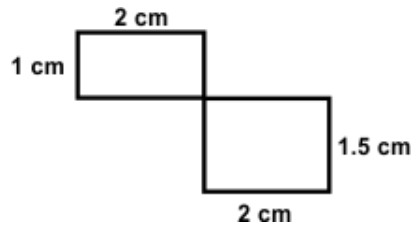
62. Find the area of the square whose one side is 2.5 cm long.

- a.  $6.5 \text{ cm}^2$
- b.  $6.55 \text{ cm}^2$
- c.  $6.225 \text{ cm}^2$
- d.  $6.25 \text{ cm}^2$

63. Find the area of the box whose length is 9 cm and breadth is 5 cm:

- a.  $40 \text{ cm}^2$
- b.  $28 \text{ cm}^2$
- c.  $45 \text{ cm}^2$
- d.  $25 \text{ cm}^2$

64. Find the area of the given figure:










- a.  $6 \text{ cm}^2$
- b.  $7 \text{ cm}^2$
- c.  $5 \text{ cm}^2$
- d.  $4 \text{ cm}^2$

65. The following pictograph shows the number of computers sold by a company during a week.

Scale Used = 5 computers.

From this pictograph answer the question: -

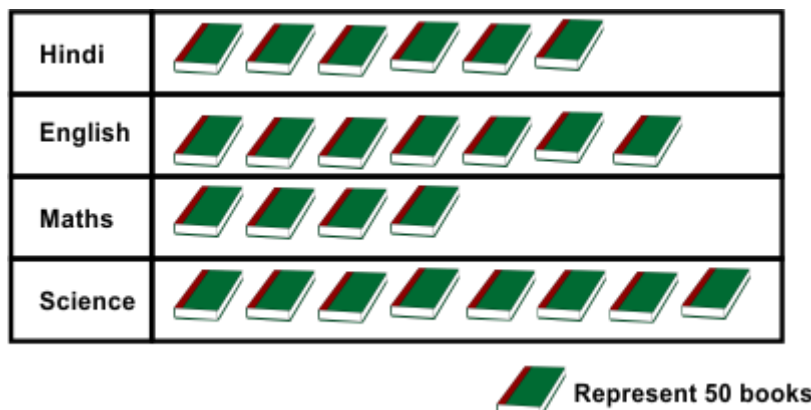
How many computers were sold on Monday?

Scale Used  = 5 computers	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

- a. 20
- b. 40
- c. 30
- d. 50





66. A school library has different subject books shown in the given pictograph.

What is the total number of books in the library?



- a. 1150 books
- b. 1250 books
- c. 1200 books
- d. 1300 books


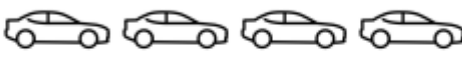


67. Read the pictograph given below and answer the following question:  
What is the number of persons employed in government service?

Job	Number of Persons	Each  = 3000 persons
Private Service		
Government Service		
Factory Service		

- a. 20000
- b. 35000
- c. 30000
- d. 28000

68. Mr Robert made a pictograph below to show the number of cars washed at a car washing station three days a week.

From the pictograph, find the number of cars were washed on Friday:

Days	Number of cars washed	One  = 5
Friday		
Saturday		
Sunday		

- a. 24
- b. 16
- c. 20
- d. 22

69. How many lines of symmetry does a regular hexagon have?

- a. 5
- b. 7
- c. 6
- d. 4

70. Which of the following letters has point symmetry?

- a. A
- b. M
- c. O
- d. P

- 71.** A car travels at a speed of 55 km per hour for 4 hours. How far does the car travel?
- a. 200 km    b. 220 km  
c. 210 km    d. 122 km
- 72.** A train travels a distance of 64 km at a speed of 8 km/h. How long does it take the train to travel this distance?
- a. 3 hrs    b. 2 hrs  
c. 6 hrs    d. 8 hrs
- 73.** A shopkeeper buys a pencil for \$0.50 and sells it for \$0.75. How much profit does he make?
- a. \$0.25    b. \$0.50  
c. \$0.75    d. \$1
- 74.** A man buys a watch for \$55 and sells it for \$70. What is his profit percentage?
- a. 27.24%    b. 27.39%  
c. 25.25%    d. 27.27%
- 75.** A father is 48 years old. His son is half of his father's age. What is the son's age?
- a. 22    b. 28  
c. 24    d. 20
- 76.** Morgan is thrice as old as his sister. If his sister's age is 8 years, how old is Morgan?
- a. 32    b. 23  
c. 24    d. 22
- 77.** The marks of a student in 5 subjects are 80, 75, 90, 85, and 70. What is the average marks of the student?
- a. 450    b. 50  
c. 400    d. 80
- 78.** Find the average:  
23, 37, 47, 61.
- a. 42    b. 24  
c. 64    d. 40
- 79.** The ratio of boys to girls in a school is 5 : 3. How many boys are there if there are 90 girls?
- a. 165    b. 150  
c. 120    d. 100

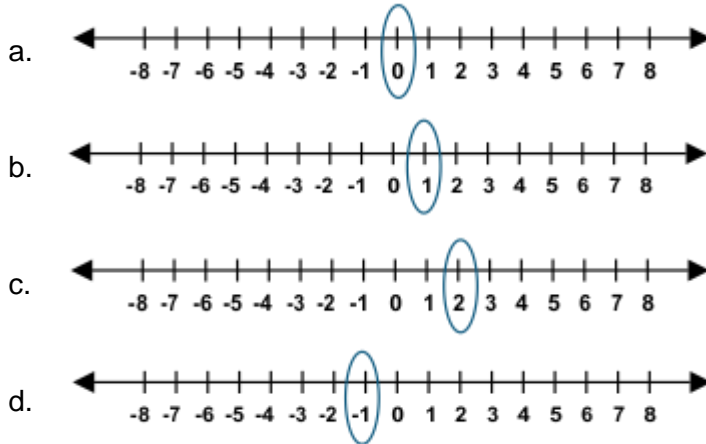
80. Express 32 : 60 in its simplest form.

- a. 9 : 15
- c. 8 : 15

- b. 16 : 15
- d. 9 : 20

### Avance (Each Question is 6 Marks)

81. What is the difference between -4 and 5?



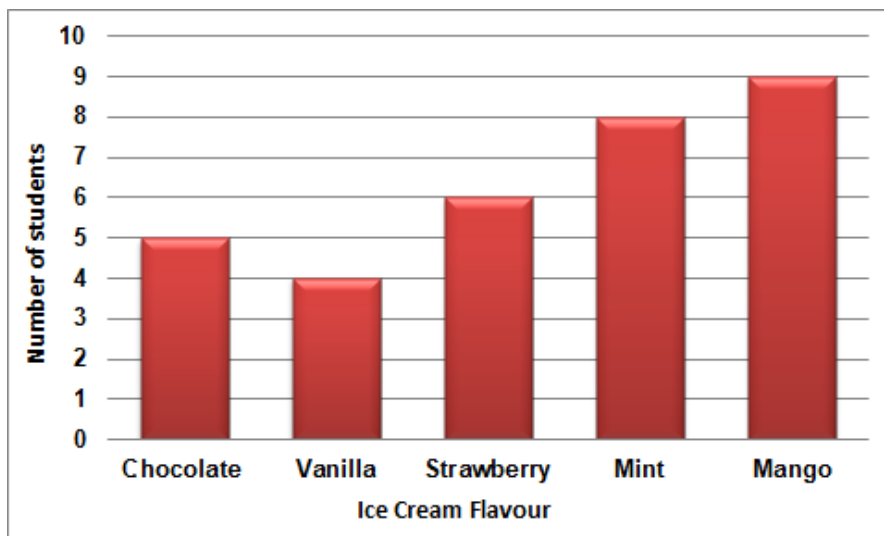
82. Out of 30 students in a class,  $\frac{2}{5}$  are boys. How many girls are in the class?

- a. 12 girls
- c. 18 girls

- b. 14 girls
- d. 20 girls

83. The given bar graph shows a survey was conducted to determine the favourite ice cream flavour of students in a class. Study it and answer the following.

Which flavour of ice cream is the most popular among the students in the class?



- a. Mint
- c. Mango

- b. Vanilla
- d. Chocolate

84. Mark received a 92% and a 78% on the first two maths tests. What grade must he receive on the third test to have an average of 84%?

- a. 80%
- b. 82%
- c. 84%
- d. 86%

85. The product of two numbers is 6272, and 4 times of one of the numbers is 256. What is the other number?

- a. 89
- b. 98
- c. 100
- d. 198

86. Sum of two integers is -80. If one of them is -90, then what will be the other integer?

- a. -10
- b. -80
- c. 10
- d. 5

87. Which fraction is the smallest?

- a.  $\frac{3}{6}$
- b.  $\frac{4}{6}$
- c.  $\frac{5}{12}$
- d.  $\frac{11}{12}$

88. What is the place value of 6 in the decimal number 12.56?

- a. Thousandths
- b. Hundredths
- c. Ones
- d. Tenths

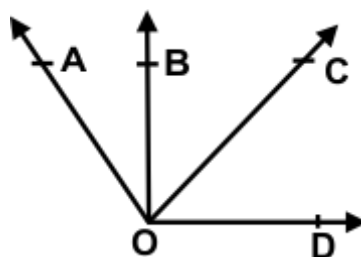
89. Which of the following number are divisible by 4?  
36474, 216221, 209810, 99238, 394234, 20496516

- a. 394234
- b. 20496516
- c. 216221
- d. 36474

90. Which of the following can be drawn on a piece of paper?

- a. A line
- b. A line segment
- c. A ray
- d. A plane

91. How many angles are formed in the given figure?



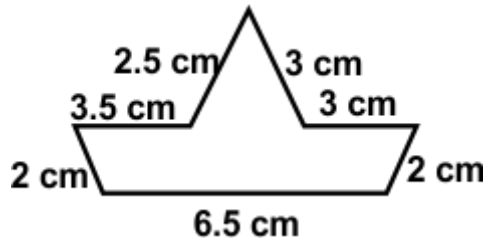


- a. Nine
- b. Six
- c. Four
- d. Eight

92. The sum of the interior angles of a polygon with n sides is:

- a.  $180n$
- b.  $360n - 360$
- c.  $90n$
- d.  $180(n - 2)$

93. Find the perimeter of the figure given below:

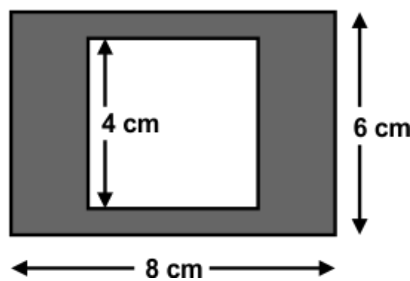


- a. 22 cm
- b. 22.1 cm
- c. 22.58 cm
- d. 22.5 cm

94. Find the area of the tile which is 25 cm long and 12 cm wide.

- a.  $280 \text{ cm}^2$
- b.  $250 \text{ cm}^2$
- c.  $320 \text{ cm}^2$
- d.  $300 \text{ cm}^2$

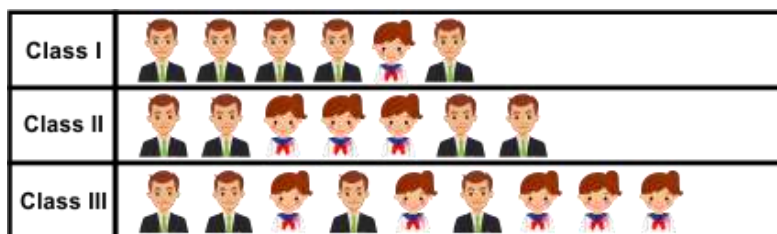
95. A rectangle has a length of 8 cm and a width of 6 cm. A square with sides of length 4 cm is inscribed inside the rectangle. Find the area of the shaded region.



- a.  $36 \text{ cm}^2$
- b.  $48 \text{ cm}^2$
- c.  $24 \text{ cm}^2$
- d.  $32 \text{ cm}^2$

96. Look at the pictograph representing a number of boys and girls in three classes. Answer the following questions:

- a. How many girls and boys are there in class II?
- b. Which class has more girls than boys?
- c. What is the difference in the number of girls and boys in class III?



= 5 Boys, = 5 Girls

- a. a. 10 boys 25 girls, b. class II, c. 10 girls more
- b. a. 10 boys 25 girls, b. class II, c. 10 boys more
- c. a. 20 boys 15 girls, b. class III, c. 5 girls more
- d. a. 15 boys 25 girls, b. class III, c. 10 boys more

97. Which of the following triangle has no lines of symmetry?

- a. Isosceles
- b. Equilateral
- c. Scalene
- d. Right

98. If a person can paint a room in 4 hours and another person can paint the same room in 6 hours, how long will it take for both people to paint the room together?

- a. 3 hrs 24 min
- b. 2 hrs 24 min
- c. 2 hrs 48 min
- d. 2 hrs 14 min

99. A person sold a goat at 6% loss. The selling price was \$3196. What was the cost price?

- a. \$3,420
- b. \$3,240
- c. \$3,400
- d. \$3,450

100. The ratio of red balls to blue balls in a bag is 3 : 4, how many blue balls are there if there are 18 red balls?

- a. 54
- b. 22
- c. 20
- d. 24

## Answer Key

1.	b	2.	a	3.	b	4.	d	5.	b	6.	d	7.	d
8.	b	9.	a	10.	a	11.	d	12.	c	13.	a	14.	a
15.	d	16.	c	17.	a	18.	c	19.	c	20.	b	21.	a
22.	a	23.	c	24.	a	25.	a	26.	a	27.	a	28.	d
29.	b	30.	c	31.	c	32.	a	33.	d	34.	a	35.	c
36.	a	37.	c	38.	a	39.	a	40.	a	41.	b	42.	c
43.	d	44.	d	45.	b	46.	b	47.	a	48.	d	49.	a
50.	c	51.	a	52.	c	53.	d	54.	a	55.	b	56.	d
57.	b	58.	c	59.	a	60.	d	61.	b	62.	d	63.	c
64.	c	65.	a	66.	b	67.	c	68.	c	69.	c	70.	c
71.	b	72.	d	73.	a	74.	d	75.	c	76.	c	77.	d
78.	a	79.	b	80.	c	81.	b	82.	c	83.	c	84.	b
85.	b	86.	c	87.	c	88.	b	89.	b	90.	b	91.	b
92.	d	93.	d	94.	d	95.	d	96.	c	97.	c	98.	b
99.	c	100.	d										