CREST Mental Maths Olympiad (CMMO)

Previous Year Paper

Class 11

Time Allowed: 1 hour **Maximum Marks: 360**

- Additional **10 minutes** will be allotted to fill up information on the OMR Sheet, before the start of the exam.
- Fill in all the mandatory fields clearly on the OMR Sheet.
- There are a total of **100 questions** in this booklet comprising **2 sections** namely the **Basique and Avance** consisting of **80 questions (3 mark each) & 20 questions (6 marks each),** respectively.
- There's a **negative marking** of 1/3rd marks for every wrong answer. The use of a calculator is not permitted.
- There is **only ONE correct option** to a given question.
- Use **HB Pencil or Blue / Black ball point pen only** for marking the correct choice of answers on the OMR Sheet.
- Rough work is to be done in the space provided in the test booklet. An extra plain sheet may be provided by the school for the rough work.
- The OMR Sheet is to be handed over to the invigilator at the end of the exam.
- No candidate is allowed to carry any textual material, printed or written, bits of paper, any electronic device, etc. inside the examination hall.
- The use of unfair means may result in the cancellation of the exam. Any such instances may be reported at **+91-98182-94134** or **info@crestolympiads.com**

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

FILL IN THE DETAILS

Candidate Name: _____

Class: _____Section: _____

CREST ID:_____

Basique (Each Question is 3 Marks)

1. Divide:
$\sqrt{162}$ by $\sqrt{2}$

a. 7
b. 9
c. 8
d. 6

2. If $(\sqrt[4]{49}) = x^{1/2}$, what is the value of x?

a. 4
b. 6
c. 7
d. 9

3. Mt. Everest, the highest elevation in Asia, is 25278 feet above sea level. The Dead Sea, the lowest elevation, is 1,647 feet below sea level. What is the difference between these two elevations?

a. 23631
b. 23456
c. 23654
d. 23142

4. The product of 2 numbers is 368 and the difference between these two numbers is 7. Find the numbers.

a. 23, 16
b. 28, 11
c. 26, 14
d. 25, 7

5. Express 2.6666…….. in the form of $\frac{p}{q}$.

a. $\frac{13563}{10000}$
b. $\frac{1333}{1000}$
c. $\frac{233}{100}$
d. $\frac{13333}{5000}$

6. Express $\frac{2}{11}$ as a decimal fraction.

a. 0.181818 .....
b. 0.18
c. 0.282828
d. 0.28

7. The mean of 20 numbers is 18. If 2 is added to each number, what is the new mean?

a. 20
b. 22
c. 24
d. 26

8. The mean of 5 observations 3, 5, 7, x and 11 is 7, find the value of x.

a. 9
b. 10
c. 11
d. 12

9. Find the mode in the data given below:
1, 1, 7, 9, 5, 4, 5, 9, 5, 6, 7, 2, 3, 2, 4

a. 1
b. 2
c. 3
d. 5

10. Which of the numbers 3, 2, –2, 1 are zeros of the polynomial $x^2 - 4$?

a. 1, -2
b. 3, -2
c. 2, -2
d. 2, -1

11. What should be subtracted from the polynomial $x^2 - 16x + 30$ so that x = 15 is a zero of the polynomials?

a. 12
b. 15
c. 13
d. 17

12. If $P(y) = y^2 - y + 1$ then, what is the value of P (3)?

a. 3
b. 5
c. 7
d. 9

13. What is the value of x in $\frac{(x+3)}{x} = 4x$?

a. 1, $\frac{-3}{4}$
b. 2, $\frac{-2}{5}$
c. 1, 1
d. 2, $\frac{1}{3}$

14. What is the remainder when $p(x) = x^3 - ax^2 + 6x - a$ is divided by x - a?

a. 5a
b. 6a
c. 2a
d. 8a

15. Find the roots of the equation:
$3x^2 + 15x + 18 = 0$

a. -1, 2
b. 2, -2
c. -3, -2
d. 3, -3

16. Solve:
$(3^6 \div 3^3) \times 3^0$

a. 15
b. 19
c. 23
d. 27

17. Solve:
$36 \times 6^1 + 10 - 5^2$

a. 185
b. 201
c. 220
d. 243

18. Evaluate:
$(6 + 6^2 - 36 + 4^3)$

a. 50
b. 60
c. 70
d. 80

19. A car travel for 7 hours. If it travels the first half at 30 km/h and the second half at 40 km/h. Find the total distance covered by the car.

a. 240 km
b. 230 km
c. 210 km
d. 220 km

20. Two persons cover the same distance at speeds of 25 km/h and 30 km/h respectively. Find the distance travelled if one person takes 25 minutes more than the other.

a. 64.25 km
b. 66.3 km
c. 62.5 km
d. 60.5 km

21. A boy goes to school at a speed of 6 km/h and returns to his house at a speed of 4 km/h. If he takes 5 hrs in all, what is the distance between his house and the school?

a. 15 km
b. 14 km
c. 24 km
d. 12 km

22. The simple interest of a sum of money is $\frac{1}{9}$ of the principal, and the number of years is equal to the rate per cent per annum. Find the rate per cent.

a. 3
b. $\frac{2}{5}$
c. $\frac{10}{3}$
d. 7

23. Sam invested an amount of $8000 at a compound interest rate of 8% per annum for a period of three years. How much amount will Sam get after 2 years?

a. $3,535.45
b. $9,331.20
c. $8,765.43
d. $5,477.57

24. A dishonest dealer professes to sell his goods at the cost price, but he uses a weight of 950 g for 1 kg. Find his gain %.

a. 43%
b. $3\frac{37}{7}\%$
c. $4\frac{13}{19}\%$
d. $5\frac{5}{19}\%$

25. By selling goods for $1400, a trader loses 20%. Find the cost price.

a. $1,750
b. $1,460
c. $1,728
d. $1,547

26. The average age of 20 teachers is 45 years which is decreased by $\frac{6}{7}$ years when a student joins this group. Then what is the age of that student?

a. 27
b. 15
c. 28
d. 18

27. At present, the age of a father is three times that of his son. Five years hence, the father's age would be two times that of his son. Find the present age of the son.

a. 9
b. 5
c. 8
d. 7

28. The product of Samuel's age (in years) five years ago and his age (in years) nine years later is 15. Determine Samuel's present age.

a. 4
b. 6
c. 7
d. 3

29. A and B together can do a piece of work in 6 days and A alone can do it in 9 days. In how many days can B alone do it?

a. 15
b. 14
c. 18
d. 11

30. Pipe A can fill the tank in 80 minutes and pipe B in 120 minutes. Then after how much time both pipes can together fill the tank?

a. 32 minutes
b. 48 minutes
c. 45 minutes
d. 35 minutes

31. A boat goes 8 km upstream in 48 minutes. The speed of the stream is 4 km/h. What is the speed of a boat in still water?

a. 14 km/h
b. 15 km/h
c. 13 km/h
d. 10 km/h

32. The speed of a boat in still water is 7 km/h. If its speed downstream is 10 km/h. Find the speed of the stream.

a. 6 km/h
b. 10 km/h
c. 3 km/h
d. 7 km/h

33. Over the summer Jason grew from 70 inches to 73.5 inches. What per cent has Jason's height increased?

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

34. The average salary of 15 persons is $5,500. If the salary of one person is added, the average increase to $5,700. What is the salary of this one person?

a. 8410
b. 8560
c. 8700
d. 8430

35. Three partners A, B, and C invest $2200, $2800, and $3200 respectively in a business. How should they divide the profit of $2624?

a. $704, $896, $1024
b. $356, $578, $798
c. $983, $970, $986
d. $574, $667, $865

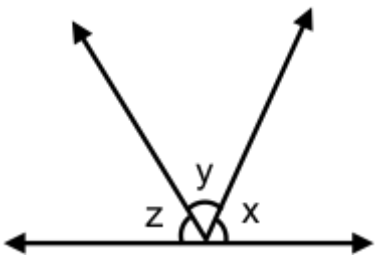
36. How should a profit of $450 be divided between two partners, one of whom has contributed $1200 for 5 months and the other $750 for 4 months?

a. $110, $90
b. $300, $150
c. $200, $250
d. $200, 350

37. Find the present worth of $1341 due, 4 years at 9% per annum.

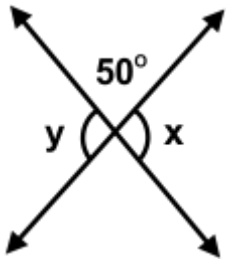
a. $660
b. $760
c. $870
d. $950

38. If three angles x, y, and z are angles as shown in the figure. Find the value of $\frac{1}{2z}$ if x = 58° and y = 42°.



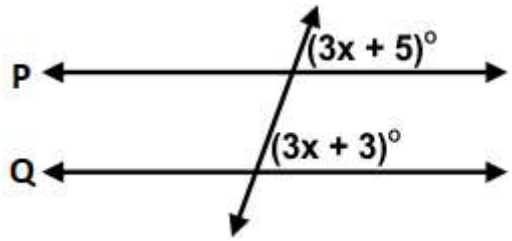
a. 45°
b. 40°
c. 50°
d. 55°

39. In the figure, find the value of x + y.



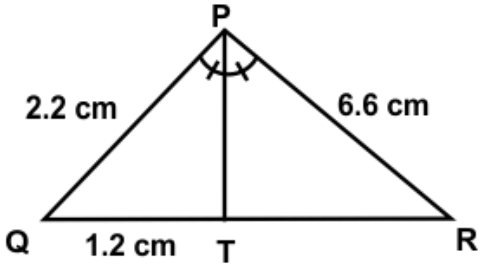
a. 210°
b. 240°
c. 230°
d. 260°

40. In the given figure, P || Q, what is the value of x?



a. -2
b. -3
c. -1
d. -4

41. In figure, PT is bisector of ∠QPR, find TR.

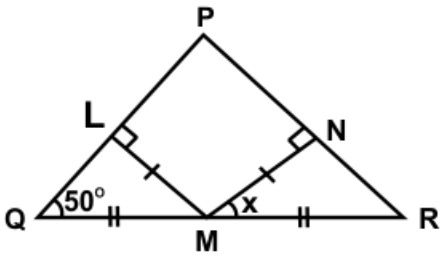


a. 3.2 cm
b. 3.1 cm
c. 3.6 cm
d. 3.9 cm

42. ABC is an isosceles triangle in which ∠C = 90°. If AC = 6cm, find AB^2.

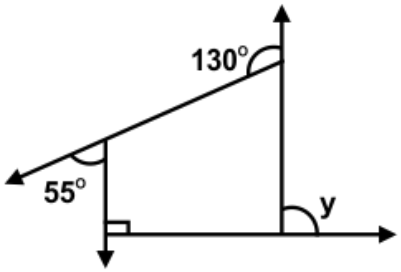
a. 72 cm
b. 77 cm
c. 71 cm
d. 75 cm

43. In the figure LM = MN, QM = MR, LM ⊥ PQ, MN ⊥ PR, Q = 50°. Find x



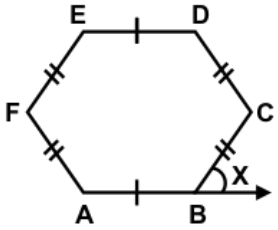
a. 35°
b. 40°
c. 55°
d. 60°

44. Find y.



a. 75°
b. 60°
c. 85°
d. 45°

45. ABCDEF is regular hexagon. What is the value of the exterior angle X?

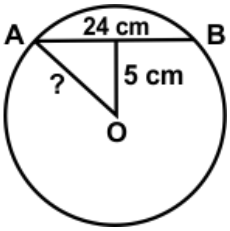


a. 70°
b. 55°
c. 45°
d. 60°

46. ABCD is a cyclic quadrilateral. If ∠A = 110° and ∠B = 60°. Find the sum of ∠B and ∠C.

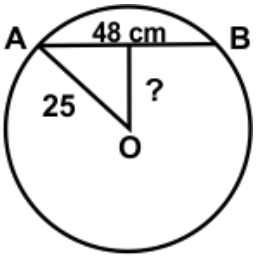
a. 80°
b. 130°
c. 70°
d. 60°

47. In the adjoining figure, chord AB is at a distance of 5 cm from centre O of the circle. Find radius of circle if length of the chord is 24 cm.



a. 13 cm
b. 18 cm
c. 23 cm
d. 22 cm

48. In the figure, length of the chord of a circle of radius 25 cm is 48 cm. Find the distance of chord from the centre of circle.



a. 5 cm
b. 4 cm
c. 7 cm
d. 8 cm

49. The sides of a triangle are in the ratio 2 : 3 : 5. If the perimeter of triangle is 50 cm. Find the three sides.

a. 8 cm, 9 cm, 210 cm
b. 5 cm, 8 cm, 12 cm
c. 9 cm, 12 cm, 15 cm
d. 10 cm, 15 cm, 25 cm

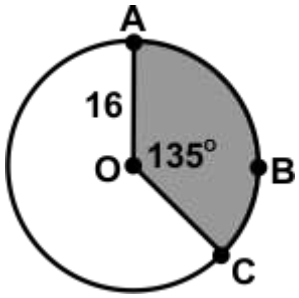
50. If s is the semi-perimeter and a, b, c are the sides of the triangle, s - a = 12 cm, s - b = 9 cm, s - c = 4 cm, then what is the value of s?

a. 25 cm
b. 23 cm
c. 27 cm
d. 26 cm

51. Find the perimeter of the protractor if its diameter is 14 cm. $\left(\pi = \frac{22}{7}\right)$

a. 36 cm
b. 26 cm
c. 20 cm
d. 30 cm

52. In the given figure, what is the area of the shaded sector in circle?



a. 75π
b. 68π
c. 59π
d. 96π

53. Find the area of a circle whose diameter is 16 cm.

a. 142.23 cm^2
b. 113.3 cm^2
c. 200.96 cm^2
d. 336.24 cm^2

54. Three cubes of the same metal, whose edges are 6, 8, and 10 cm are melted and formed into a single cube. Find the diagonal of the single cube.

a. $8\sqrt{3}$ cm
b. $7\sqrt{2}$ cm
c. $5\sqrt{2}$ cm
d. $12\sqrt{3}$ cm

55. The Volume of the right circular cylinder is 792 cm^3, height of the cylinder is 7 cm. Find the radius.

a. 8 cm
b. 12 cm
c. 10 cm
d. 9 cm

56. Three cubes whose sides are 6 cm, 8 cm and 10 cm. They are melted and form a cube. Find the volume of that cube.

a. 1328 cm^3
b. 1243 cm^3
c. 1432 cm^3
d. 1574 cm^3

57. The total volume of a cube is 512 cm^3. Find the side of a cube.

a. 12 cm
b. 18 cm
c. 16 cm
d. 8 cm

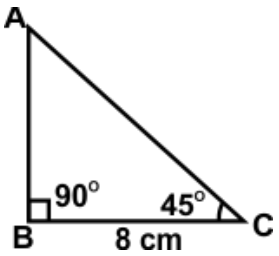
58. The volume of a solid sphere is 36π cm^3. Find its radius.

a. 5 cm
b. 3 cm
c. 7 cm
d. 9 cm

59. 150 m from the foot of a building on the level ground, the angle of an elevation of the top of a cliff is 45°. Find the height of this building.

a. 134 m
b. 154 m
c. 150 m
d. 165 m

60. In the figure, find the area of ΔABC is which ∠ACB = 45°, and BC = 8 cm.



a. 33 cm^2
b. 37 cm^2
c. 30 cm^2
d. 32 cm^2

61. Solve:
140% of 56 + 56% of 140 = ?

a. 145.3
b. 126.5
c. 156.8
d. 185.5

62. Solve:
$73 \times 18 + 486 = ? + (13)^2$

a. 1543
b. 1455
c. 1345
d. 1631

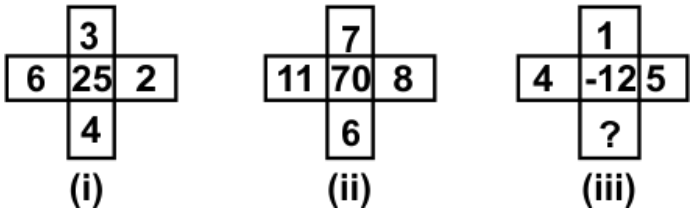
63. Solve:
(0.88 × 880 ÷ 8) × 6 = ?

a. 580.8
b. 580
c. 588
d. 568.53

64. Fill in the blank with the appropriate choice:
1, 5, 9, 13, ____

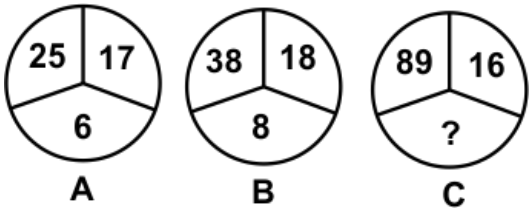
a. 11
b. 17
c. 15
d. 18

65. Find the missing number:



a. 1
b. 3
c. 2
d. 4

66. Find the missing number:



a. 11
b. 12
c. 13
d. 15

67. If x stands for -, / stands for +, + stands for / and - stands for x, which one of the following equations is correct?

a. -114
b. -89
c. 132
d. 123

68. Which number is divisible by 17?
25435, 643753, 109276, 156446

a. 25435
b. 109276
c. 156446
d. 643753

69. Which number is divisible by 2 and 8?
15562, 36992, 53266, 658782

a. 658782
b. 53266
c. 36992
d. 15562

70. Which number is divisible by 19?
897844, 75624, 14123, 69711

a. 75624
b. 897844
c. 14123
d. 69711

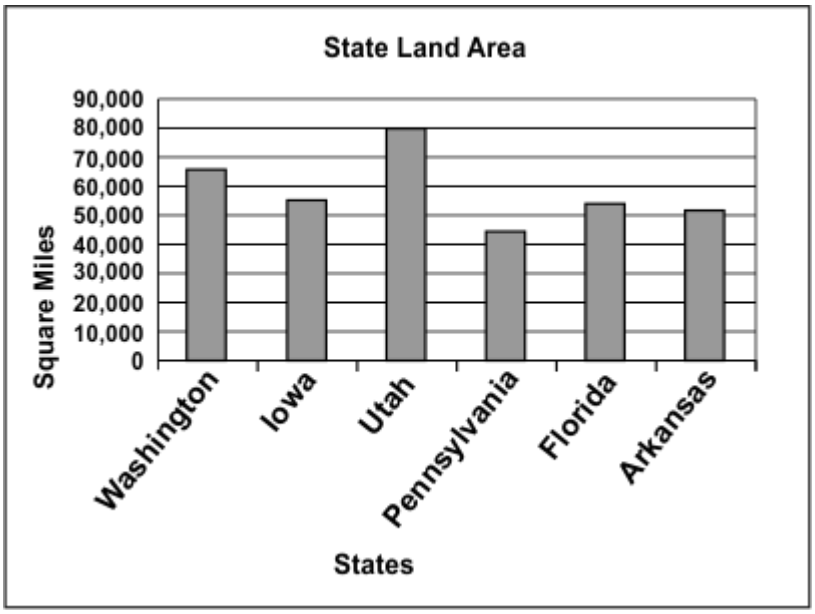
71. Simplify:
$(x + 3)^2 - 5(x + 3)$

a. (2x - 3)(x - 2)
b. (x + 3)(x - 2)
c. (x + 3)(x + 1)
d. (x + 3)(x - 2)

72. Evaluate:
$mn - ab(m + n) + a^2b^2$

a. (n - ab)(m - ab)
b. (2n - ab)(m - 2ab)
c. (3n + ab)(2m + ab)
d. (n + ab)(5m - 3ab)

73. The bar graph below shows the land area, in square miles, for six different states. Which of these states has land area greater than 80,000 square miles?



a. Florida
b. Utah
c. Washington
d. Iowa

74. The line - graph gives the annual profit earned by a company during the period 2017-2022. Study the line graph and answer the question that are based on it.
If the income in 2022 was $264 million, what was the expenditure in 2022?

a. $140
b. $165
c. $150
d. $170

75. A bag contains 20 cards numbering 1, 2, 3, ... , 20. One card is drawn from the bag. Find the probability that it has a prime number.

a. $\frac{3}{5}$
b. $\frac{1}{5}$
c. $\frac{4}{5}$
d. $\frac{2}{5}$

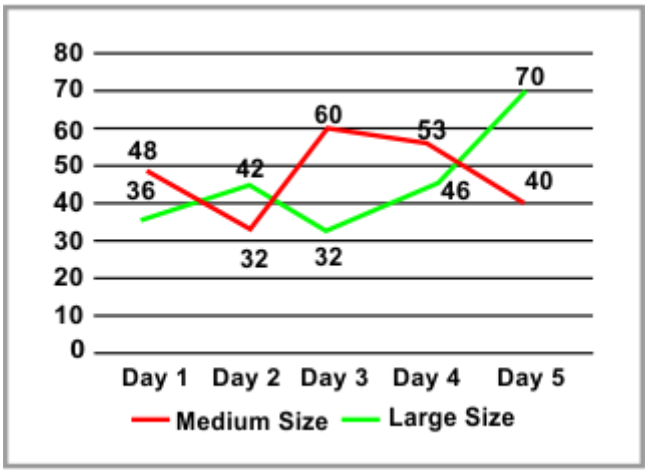
76. A die is thrown once. Find the probability of getting a prime number.

a. 1/2
b. 1/3
c. 1/4
d. 1/4

77. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a face card.

a. 1.4
b. 0.5
c. 0.34
d. 0.01

78. The following line graph shows the sales of boxes of two sizes medium and large on 5 different days by a company ABC. Study the graph carefully and answer the question given below:
How many large size boxes were sold together in all the given days?



a. 226
b. 232
c. 210
d. 216

79. What will come in place of question mark (?) in the following number series?
2, 6, 14, 30, ?, 126, 254

a. 61
b. 62
c. 64
d. 67

80. What will come in place of question mark (?) in the following equation? (approx.)
2439.97 – 1234.01 + 401.99 = ? + 989.99

a. 618
b. 630
c. 650
d. 680

Avance (Each Question is 6 Marks)

81. Solve the question:
$\frac{-3}{5} + \frac{4}{5} - \frac{4}{5} + \frac{1}{8} - \frac{1}{10}$

a. $\frac{-7}{20}$
b. $\frac{7}{20}$
c. $\frac{5}{14}$
d. $\frac{-5}{14}$

82. Find the decimal representation of $\frac{-16}{45}$.

a. 0.7888…….
b. 0.3555…….
c. 0.78
d. 0.35

83. Find the value of 11^{th} term of the A.P, whose first two terms are –3 and 4.

a. 45
b. 65
c. 76
d. 67

84. Factorise:
5y(x +7) - 4(x + 7)

a. (2x + 7)(y - 4)
b. (x + 7)(5y - 4)
c. (x - 7)(5y - 4)
d. (x + 7)(3y - 4)

85. In what period of time does a sum of money increase by four times at a simple interest rate of 5% per year?

a. 20 years
b. 60 years
c. 30 years
d. 40 years

86. A man sold two watches at $450 each. He sold one at a loss of 15% and the other at a gain of 15%. What is the total loss or gain percentage?

a. 2.25% profit
b. 15% loss
c. 2.25% loss
d. 15% profit

87. A man swim downstream 30 km and upstream 18 km, taking a time of 3 hours each. What is the velocity of current?

a. 4 km/h
b. 2 km/h
c. 3 km/h
d. 5 km/h

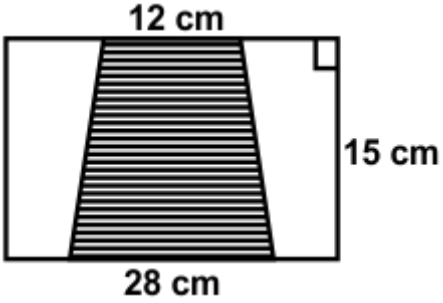
88. A began a business with $2100 and is joined afterward by B with $3600. After how many months did B join, if the profit at the end of the year is divided equally?

a. 7 months
b. 6 months
c. 5 months
d. 3 months

89. The true discount on a bill due 10 months at 15% per annum is $225. What is the amount of bill?

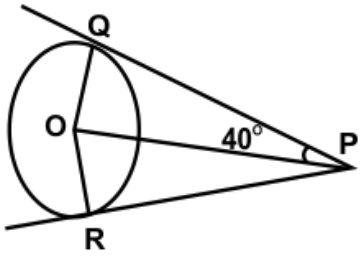
a. $1,400
b. $1,800
c. $1,600
d. $1,700

90. In the adjoining figure, find the area of the shaded portion.



a. 300 cm^2
b. 250 cm^2
c. 200 cm^2
d. 280 cm^2

91. Find ∠QOP.



a. 35°
b. 40°
c. 45°
d. 50°

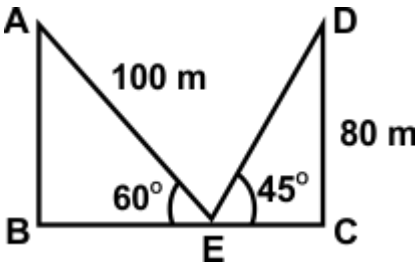
92. If s is the semi-perimeter and a, b, c are the sides of the triangle, a = 25 cm, b = 15 cm, and c = 20 cm, what is the value of (s – b)?

a. 12 cm
b. 20 cm
c. 15 cm
d. 14 cm

93. A cube of side 3 cm is melted and similar cubes of sides 1 cm each are formed. How many such cubes are possible?

a. 12
b. 27
c. 13
d. 35

94. In the figure, find BC.



a. 136 cm
b. 130 cm
c. 145 cm
d. 148 cm

95. Fill in the blank with the appropriate choice:
5, 10, 17, 26, ___

a. 29
b. 32
c. 37
d. 36

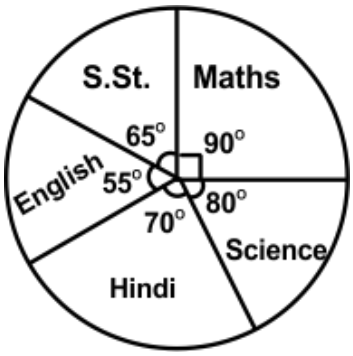
96. Which number is divisible by 14?
125548, 271726, 678724, 253546

a. 271726
b. 678724
c. 125548
d. 253546

97. What will come in place of question mark (?) in the following number series?
10, 14, 25, 55, 140, ?

a. 342
b. 360
c. 388
d. 400

98. The given pie chart depicts the marks scored in an examination by a student in different subjects.
If the total marks obtained is 540. How much marks obtained in maths?



a. 125
b. 115
c. 135
d. 120

99. The following table gives the percentage of marks obtained by seven students in six different subjects in the examination. Study the table and answer the question based on it. The number in the brackets represents maximum marks in that subject.
What is the overall percentage of Thomas?

Subject (Max. Marks) Name	Maths (150)	Chemistry (130)	Physics (120)	Geography (100)	History (60)	Com. Science (40)
Annie	90	50	90	60	70	80
Andrew	100	80	80	40	80	70
Shane	90	60	70	70	90	70
Riley	80	65	80	80	60	60
Milo	80	65	85	95	50	90
Tyler	70	75	65	85	40	60
Thomas	65	65	50	77	80	80

a. 52.50%
b. 55%
c. 60%
d. 69.5%

100. What will come in place of question mark (?) in the following equation? (approx.)
21.9% of 511.987 – 42.49 = ?/5.5

a. 382
b. 395
c. 405
d. 412

Answer Key

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