CLASS 7: MATH OLYMPIAD SAMPLE PAPER

1. Multiply 5a and 3a.

   A) $15a^1$

   B) $12a^2$

   C) $12a^1$

   D) $15a^2$

2. Find the value of x + 4.85 for x = 2.24

   A) 6.99

   B) 7.9

   C) 6.9

   D) 7.09

3. How can we express “Product of numbers y and z subtracted from 13”?

   A) (13 – y) z

   B) 13 – (yz)

   C) zy - 13

   D) 13– (y + z)

4. Simplify combining like terms: 23b – 32 + 7b – 27b

   A) 3b – 32

   B) 20b – 59

   C) 3b – 59b

   D) 30b – 32

5. State whether the polynomial given below is a monomial, binomial or trinomial.
   $4p^2$ q – 4pq^2

   A) Monomial

   B) Binomial

   C) Trinomial

   D) None of these

6. Add: (3mn, 5mn, -8mn, 4mn)

   A) 4mn

   B) -2mn

   C) -4mn

   D) 2mn

7. Subtract: (a – b) from (a + b)

   A) b

   B) -2b

   C) –b

   D) 2b

8. What should be subtracted from 8a + 2b + 10 to get – 7a + 3b + 16?

   A) -15a + b + 6

   B) 15a – b – 6

   C) 15a – b + 6

   D) 15a + b + 6

9. From the sum of $5x - y + 17$ and $-y - 17$, subtract $5x - y - 17$.
   A) $y + 17$
   B) $y - 17$
   C) $-y + 17$
   D) $-y - 17$

10. If $m = 3$, find the value of: $11 - 5m$.
   A) 1
   B) -1
   C) 4
   D) -4

11. A plane is flying at the height of 3500 m above the sea level. At a particular point, it is exactly above a submarine floating 1300 m below the sea level. What is the vertical distance between them?
   A) 2200m
   B) 3800m
   C) 4800m
   D) None of these

12. A water tank has steps inside it. A monkey is sitting on the topmost step (i.e., the first step). The water level is at the ninth step. He jumps 3 steps down and then jumps back 2 steps up. In how many jumps will he reach the water level?
   A) 9 jumps
   B) 8 jumps
   C) 7 jumps
   D) 6 jumps

13. Write down a pair of integers whose: sum is –9

A) 11, -2
B) -11, 2
C) -12, 4
D) 12, -3

14. Fill in the blanks to make the following statements true:
[12 + (– 13)] + (.....) = 12 + [(–13) + (–7)]
A) -7
B) 7
C) 6
D) -6

15. Acertain freezing process requires that room temperature be lowered from 50°C at the rate of 5°C every hour. What will be the room temperature 12 hours after the process begins?
A) 10°C
B) -10°C
C) 11°C
D) -11°C

16. In a class test containing 20 questions, 5 marks are awarded for every correct answer and (–2) marks are awarded for every incorrect answer and 0 for questions not attempted. Mike gets eight correct and six incorrect answers. What is his score?

A) 28 B) -38 C) 38 D) 40

17. A cement company earns a profit of $10 per bag of white cement sold and a loss of $5 per bag of grey cement sold. What is the number of white cement bags it must sell to have neither profit nor loss, if the number of grey bags sold is 6,400 bags?
A) 3200 bags
B) 3000 bags
C) 6400 bags
D) 6000 bags

18. In a class test (+ 3) marks are given for every correct answer and (–2) marks are given for every incorrect answer and no marks for not attempting any question. Jack scored 20 marks. If he has got 12 correct answers, how many questions has he attempted incorrectly?
    A) 7
    B) 5
    C) 9
    D) 8

19. An elevator descends into a mine shaft at the rate of 8 m/min. If the descend starts from 10 m above the ground level, how long will it take to reach 790 m below ground level?
    A) 4 hour 40 minutes
    B) 3 hour 40 minutes
    C) 2hour 40 minutes
    D) 1 hour 40 minutes

20. Find the value of: 2^5
    A) 16
    B) 32
    C) 64
    D) 10

21. Using laws of exponents, simplify and write the answer in exponentialform:
    $(2^{20} \div 2^{15}) \times 2^3$
    A) 2^7
    B) 2^6
    C) 2^9
    D) 2^8

22. Simplify and express each of the following in exponential form:

$2^0 \times 3^0 \times 4^0$

A) 0
B) 1
C) 9
D) 24

23. Express each of the following as a product of prime factors only in exponential form: 270

A) $2 \times 3^3 \times 5$
B) $2 \times 2^3 \times 5$
C) $2 \times 3^2 \times 5$
D) $2 \times 2^2 \times 5$

24. Simplify:

$$\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5}$$

A) 0
B) 1
C) 2
D) 3

25. Write the following numbers in the expanded forms: $(8\times10^3) + (7\times10^3) + (0\times10^{11}) + (4\times11) + (5\times10^0)$

A) 15049
B) 150049
C) 1549
D) 154.9

26. Express the following numbers in standard form:

74,63,51,00,000

A) 74.63451×10^8
B) 746351×10^6
C) 746.351×10^7
D) 7.46351×10^{10}

27. Express the number appearing in the following statements in standardform. The earth has 1,766,000,000 cubic km of sea water.

A) $1.766 \times 10^9 mm^3$
B) $1.766 \times 10^9\ km^3$
C) $1.766 \times 10^9 km^2$
D) $1.766 \times 10^9 m^2$

28. Arrange the following in descending order: $\frac{2}{11}$ $\frac{2}{4}$ $\frac{8}{12}$

A) $\frac{8}{12}$ $\frac{2}{4}$ $\frac{2}{11}$

B) $\frac{2}{11}$ $\frac{8}{12}$ $\frac{2}{4}$

C) $\frac{2}{11}$ $\frac{2}{4}$ $\frac{8}{12}$

D) $\frac{2}{4}$ $\frac{2}{11}$ $\frac{8}{12}$

29. Rita ate $\frac{3}{5}$ part of an apple and the remaining apple was eaten by he brother Sam. How much part of the apple did Sam eat?

A) $\frac{2}{5}$ B) $\frac{3}{5}$

C) $\frac{3}{2}$ D) $\frac{4}{5}$

30. How many endpoints a line segment have?

A) 2

B) 1

C) 3

D) 0

31. If a line is a transversal to three parallel lines, how many points of intersections are there?
    a. 1
    b. 2
    c. 3
    d. 4

32. When the sum of the measures of two angles is 90°, the angles are called

    A) Right angle
    B) Supplementary angle
    C) Complementary angle
    D) Adjacent angle

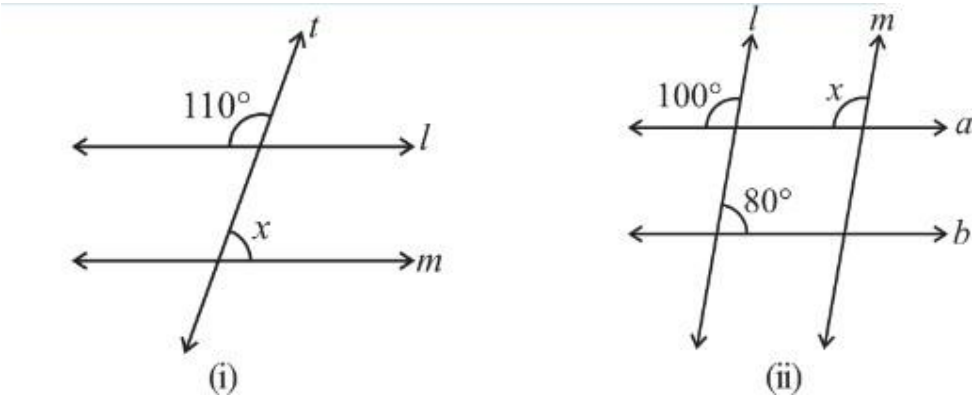
33. Which of the following pairs of angles are supplementary.
    (i) 65°, 115° (ii) 63°, 27° (iii) 112°, 68°
    (iv) 130°, 50° (v) 45°, 120° (vi) 80°, 10°
    A) (i) and (ii)
    B) (i) and (v)
    C) (i),(iii) and (iv)
    D) (iii) and (iv)

34. Among two supplementary angles the measure of the larger angle is 64° more than the measure of the smaller. Find their measures.
    A) 58°, 122°
    B) 90°,120°
    C) 112°,360°
    D) 69°, 101°

35. An angle is greater than 45°. Is its complementary angle greater than 45° or equal to 45° or less than 45°?

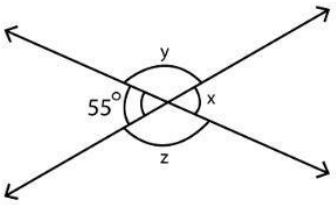
A) Equal to 45°
B) Less than 45°
C) Greater than 45°
D) None of the above

36. What is the value of x in each of the following figures if l || m.



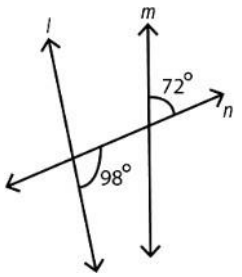
A) X= 70°, x= 100°
B) X= 110°, x= 70°
C) X= 110°, x= 80°
D) X= 110°, x= 180°

37. What is the values of the angles x, y, and z in each of the following:



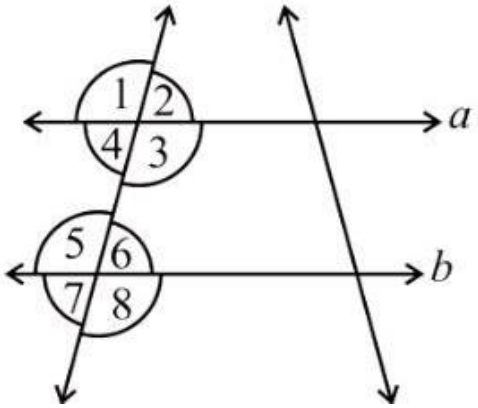
A) X=55°, y=125°, z=125°
B) X= 45°, y= 115°, z= 120°
C) X= 55°, y= 105°, z= 125°
D) X= 145°, y= 15°, z= 10°

38. In the given figure below, decide whether l is parallel to m.



A) I is not parallel to m
B) I is parallel to m
C) Cannot be defined
D) None of the above

39. State the property that is used below: If a || b, then ∠1 = ∠5.



A) Alternate interior angles
B) Pair of interior angles
C) Vertically opposite angles
D) Corresponding angles

40. Check whether the value given in the brackets is a solution to the givenequation or not

7n + 5 = 19 (n = 2)

A) Yes
B) No
C) Cannot be defined
D) None of the above

41. Write the following equations in statement forms

$\frac{3}{5}$ m = 6

A) Three-fifth of a number m is 6
B) Three-fifth of a number n is 6
C) Fifth-three of a number m is 6
D) Three-fifth of a number m is -6

42. In an isosceles triangle, the vertex angle is twice either base angle. (Let thebase angle be b in degrees. Remember that the sum of angles of a triangle is 180°). Find b.

A) b = 30°
B) b = 45°
C) b = 90°
D) b = 60°

43. Solve: 4n + 7 = 35

A) n=7
B) n=-7
C) n=-6
D) n=6

44. Solve the equation and find p.

$\frac{p}{7}$ =4

A) P=11
B) P=-11
C) P=28
D) P=49

45. Solve the following equations $7(n - 5) = 28$

A) n=15
B) n=12
C) n=9
D) n=21

46. Solve: $0 = 24 + 4(m - 24)$

A) m=20
B) m=2
C) m=64
D) m=18

47. $16 = 24 + 4(t + 12)$

A) -14
B) 14
C) 7
D) -7

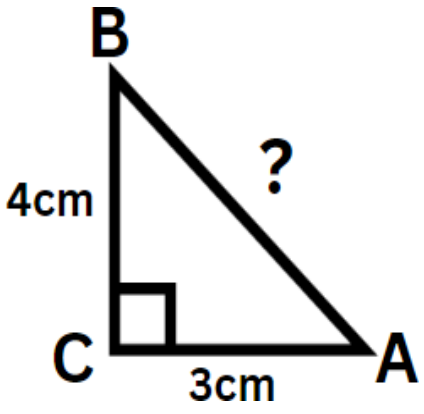
48. When I subtracted 17 from twice a number, the result was -8. The numberis?

A) 3
B) 9
C) 4.5
D) 17

49. The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 23. The highest score is 81. What is thelowest score?

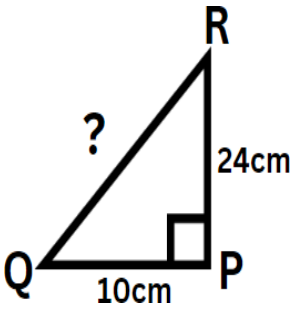
A) lowest score is 23
B) lowest score is 36
C) lowest score is 29
D) lowest score is 34

50. Δ ABC is right-angled at C. If AC = 3 cm and BC = 4 cm find the length of AB.



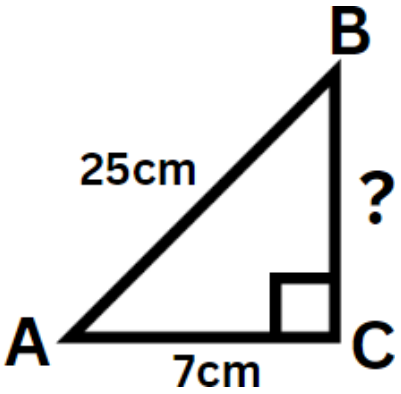
A) 5
B) 8
C) 4
D) 2

51. PQR is a triangle, right-angled at P. If PQ = 10 cmand PR = 24 cm, find QR in cm.



A) 20
B) 26
C) 30
D) 28

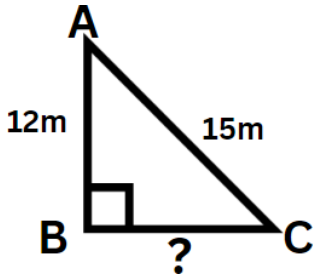
52. ABC is a triangle, right angled at C. If AB = 25 cm and AC = 7 cm, find BC.



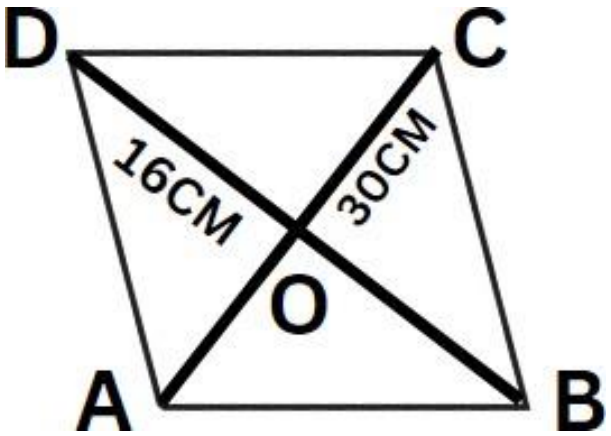
A) 21
B) 25
C) 29
D) 24

53. A 15 m long ladder reached a window 12 m high from the ground on placing it against a wall at a distance Find the distance of the foot of the ladder from the wall in metre.

A) 10
B) 9
C) 15
D) 5

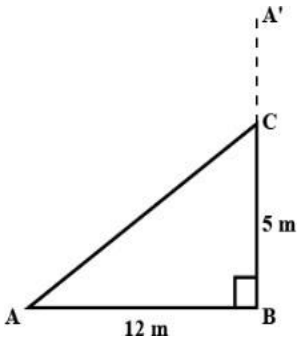


54. The diagonals of a rhombus measure 16 cm and 30 cm. Find its perimeter.



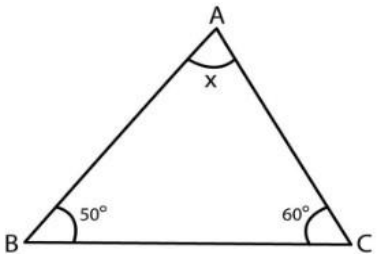
A) 68 cm
B) 70 cm
C) 40 cm
D) 88 cm

55. A tree is broken at a height of 5 m from the ground and its top touches theground at a distance of 12 m from the base of the tree. Find the original height of the tree.



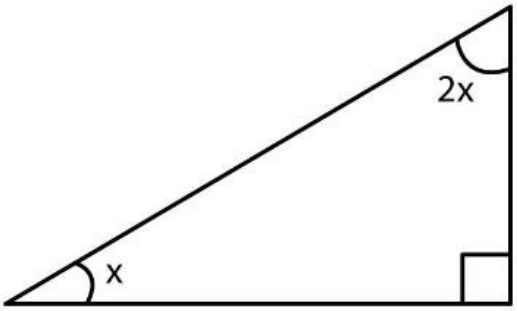
A) 13m
B) 5m
C) 18m
D) None of the above

56. Find the value of unknown angle in the following diagrams:



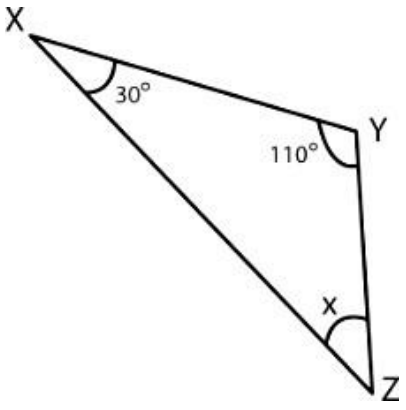
A) 70°
B) 90°
C) 45°
D) 30°

57. Find the value of x in the following diagrams:



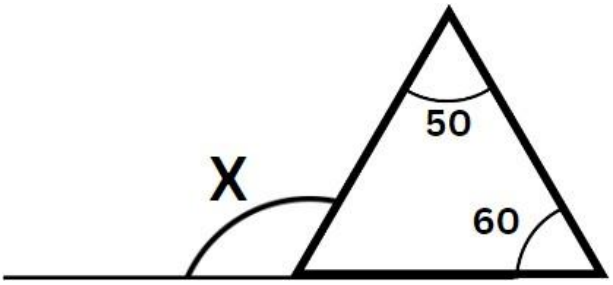
A) 90°
B) 30°
C) 180°
D) 70°

58. Find the values of the x and in the following diagrams:



A) 180
B) 40
C) 90
D)120

59. Find the values of the x in the following diagrams:



A) 110°
B) 60°
C) 30°
D) 15°

60. ΔABC and ΔPQR are congruent under the correspondence ABC ↔ RQPWrite the parts of ΔABC that correspond to RQ.

A) AB
B) BC
C) AC
D) None of these

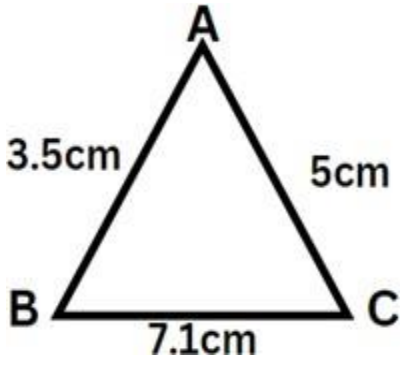
61. Which congruence criterion do you use in the following?Given: AC = DF, AB = DE, BC = EF. So, ΔABC ≅ ΔDEF

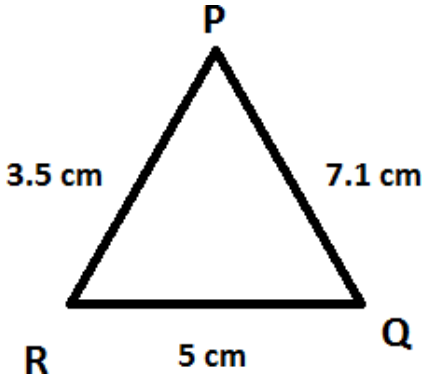
A) ASA rule
B) SAS rule
C) RHS rule
D) SSS rule

62. By applying SAS congruence rule, you want to establish that ΔPQR ≅ ΔFED.It is given that PQ = FE and RP = DF. What additional information is neededto establish the congruence?
    A) ∠P = ∠D
    B) ∠Q = ∠D
    C) ∠P = ∠F
    D) ∠R = ∠F

63. Which angle is included between the sides DE and EF of ΔDEF?
    A) ∠D
    B) ∠E
    C) ∠F
    D) None of these

64. In triangles ABC and PQR, AB = 3.5 cm, BC = 7.1 cm, AC = 5 cm, PQ = 7.1 cm,QR = 5 cm and PR = 3.5 cm. Examine whether the two triangles are congruent or not.

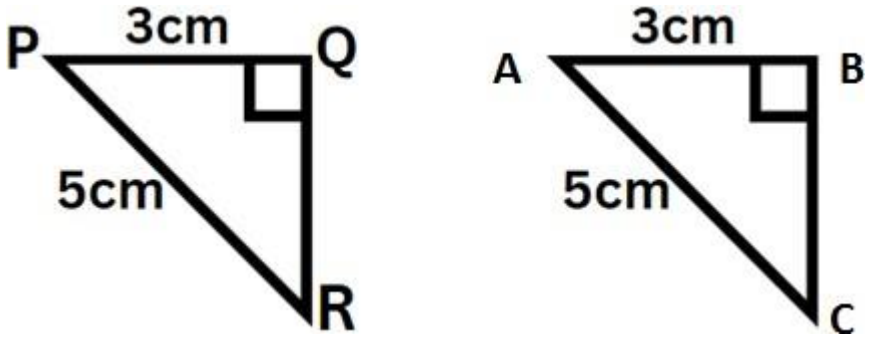




    A) Yes
    B) No
    C) Can't say
    D) None

65. In an isosceles triangle base angles opposite to the equal sides are_.
    A) Unequal
    B) Equal
    C) Can't say
    D) None of the above

66. Which of the following rules of congruency says that ΔABC = ΔPQR?



    A) RHS
    B) SSS
    C) ASA
    D) SAS

67. When two angles and the included side of one triangle are respectively equal to two angles and the included side of another triangle. This is calledthe ..... congruence of triangles.
    A) RHS
    B) SSS
    C) ASA
    D) SAS

68. What is the perimeter of the rectangle whose length is 40cm & a diagonal is41cm?
    A) 164 cm
    B) 162 cm
    C) 81 cm
    D) 98 cm

69. If the vertex angle of an isosceles triangle is 40°, then a measure of othertwo angles will be
A) 50˚,50°
B) 60 ˚,60 ˚
C) 70 ˚,70 ˚
D) 90 ˚,90 ˚

70. Name any two figures that have both line symmetry and rotationalsymmetry.
A) Circle
B) Square
C) Both of the above
D) None of the above

71. Name the geometrical figure which has both line and rotational symmetryof order more than 1.
A) Circle
B) Triangle
C) Sphere
D) Square

72. The order of rotational symmetry of the following figure is:

A) 1
B) 2
C) 3
D) 4

73. How many lines of symmetry are there in a scalene triangle?
A) 1
B) 2
C) 0
D) 3

74. A rectangle has rotational symmetry of order ……
A) 6
B) 4
C) 2
D) 1

75. A circle has …….. lines of symmetry.

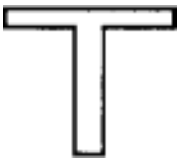
A) Many
B) Some
C) Infinite
D) none of the above

76. The letter “A” has rotational symmetry of order……
A) 1
B) 5
C) 0
D) 3

77. The number of lines of symmetry of a regular hexagon is ……..
A) 5
B) 6
C) 10
D) 13

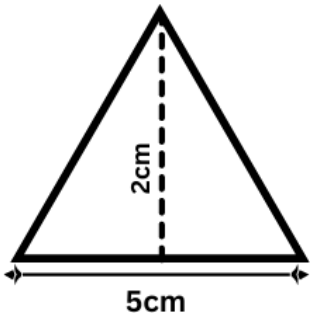
78. .A figure is said to be symmetrical about a …… if it is identical on either side of it.
A) Line
B) Plane
C) Point
D) None of the above

79. .How many lines of symmetry are there in the following figure?



A) 4
B) 3
C) 1
D) 2

80. Find the area of following triangle:



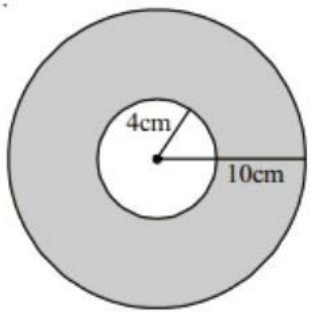
A) 6 cm^2
B) 5 cm^2
C) 4 cm^2
D) 3 cm^2

81. A door frame of dimensions 4m × 5.5m is fixed on the wall of dimension 14.5 m × 13m. Find the total labour charges for painting the wall if the labour charges for painting 1m^2 of the wall is $1.50.

A) $ 259.75
B) $ 249.75
C) $299.50
D) $ 349.75

82. What is the circumference of a circle of diameter 84cm?
    A) 615.21 cm
    B) 696.62 cm
    C) 248.19 cm
    D) 264.00 cm

83. The figure given below shows two circles with the same centre. The radius of the larger circle is 10 cm and the radius of the smaller circle is 4cm.Whatis the shaded area between the two circles (π = 3.14)



    A) 263.76 cm^2
    B) 652.23 cm^2
    C) 213.32 cm^2
    D) 523.12 cm^2

84. Find the area of the

    parallelogramHeight= 7.5cm

    Breath= 4.4cm

    A) 33 cm^2

    B) 3.3 cm^2

    C) 30 cm^2

    D) 33 cm^2

85. Find the area of the triangle base = 7.4 cm and height = 3.2 cm

A) $7.4cm^2$

B) $23.68cm^2$

C) $11.84cm^2$

D) $3.2cm^2$

86. Find the area of the triangle base = 3 cm and height = 4 cm

A) $3cm^2$

B) $4cm^2$

C) $6cm^2$

D) $2cm^2$

87. PQRS is a parallelogram. QM is the height from Q to SR & QN is the heightfrom Q to PS. If SR = 17 cm & QM = 9.7 cm. what is the area of the parallelogram PQRS?

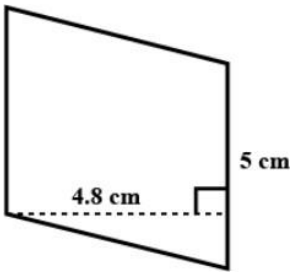
A) $61.2cm^2$

B) $91.2cm^2$

C) $164.9cm^2$

D) $45.21cm^2$

88. Find the area the following parallelogram.



A) $24\ cm^2$

B) $25\ cm^2$

C) $23\ cm^2$

D) $22\ cm^2$

89. The diameter of a roller is 98 cm and its length is 110 cm. It takes 500 complete revolutions to move once over to level a playground. Find thearea of the playground?

A) 1694m^2

B) 1854m^2

C) 1078m^2

D) 4155m^2

90. The height of a cone is 15 cm and its base radius is 8 cm. Find the curvedsurface area of the cone. (Use π = 3.14)

A) 175.84cm^2
B) 136.56cm^2
C) 123.55cm^2
D) 432.23cm^2

91. If a corncob shaped somewhat like a cone, has the radius of its broadest end as 5cm and height as 12cm. If each 1 cm^2 of the surface of the cob carries an average of four grains, find how many grains you would find onthe entire cob.

A) 511
B) 513
C) 817
D) 871

92. A village, having a population of 2000, requires 150 litres of water per headper day. It has a tank measuring 30 m × 25 m × 8 m. For how many days willthe water of this tank last?

A) 40 day
B) 30 days
C) 20 days
D) 10 days

93. A solid cube of side 12 cm is cut into eight cubes of equal volume. What willbe the side of the new cube?
    A) 7cm
    B) 6cm
    C) 8cm
    D) 4cm

94. A conical pit of top diameter 3.5 m is 12 m deep. What is its capacity in kiloliters ?
    A) 39.2
    B) 52.3
    C) 65.3
    D) 38.5

95. A hemispherical tank is made up of an iron sheet 1 cm thick. If the innerradius is 1 m, then find the volume of the iron used to make the tank.
    A) 0.0645 m^3
    B) 0.0634 m^3
    C) 0.0655 m^3
    D) 0.0693 m^3

96. Monica has a piece of canvas whose area is 551 m^2. She uses it to have a conical tent made, with a base radius of 7 m. Assuming that all the stitchingmargins and the wastage incurred while cutting, amounts to approximately1 m^2, find the volume of the tent that can be made with it.
    A) 1234m^3
    B) 1232 m^3
    C) 1245 m^3
    D) 1239 m^3

97. A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7cm. If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to prepare daily to serve 250 patients?
    A) 38.5 litres
    B) 56.2 litres
    C) 45.2 litres
    D) 52.3 litres

98. A matchbox measures 3.5 cm × 2.5 cm × 1 cm. What will be the volume ofa packet containing 16 such boxes?
    A) $180cm^2$
    B) $160cm^2$
    C) $169cm^2$
    D) $140cm^2$

99. Following are the marks in a class assessment. What is the range of the data?

    {4, 6, 7, 5, 3, 5, 4, 5, 2, 6, 2, 5, 1, 9, 6, 5, 8, 4, 6, 7}

    A) 9

    B) 8

    C) 1

    D) 2

100. John studies for 5 hours, 7 hours and 3 hours respectively on 3 consecutive days. How many hours does he study daily on an average?
    A) 4hrs
    B) 3hrs
    C) 5hrs
    D) 2hrs

101. Tell whether the following is certain to happen.

A) You are older today than yesterday
B) A tossed coin will land heads up.
C) A die when tossed shall land up with 8 on top.
D) The next traffic light seen will be green.

102. Tell whether the statement is true or false:

(i) The mode is always one of the numbers in a data.

(ii) The mean is one of the numbers in a data.

A) (i) true (ii) false
B) (i) false (ii) true
C) Both true
D) Both false

103. Find the median of the data:

{13, 16, 12, 14, 19, 12, 14, 13, 14}

A) 13
B) 14
C) 19
D) 12

104. The range of the data :22, 6, 16, 18, 11, 8, 3, 13 is

A) 19
B) 12
C) 8
D) 15

105. The difference between the highest and the lowest observations in a datais its
A) frequency
B) width
C) range
D) mode

106. In a school, only 1 out of 5 students can participate in a quiz. What is the chance that a student picked at random makes it to the competition?
A) 20%
B) 40%
C) 50%
D) 10%

107. Which measure of central tendency best represents the data of the mostpopular politician after a debate?
A) Mean
B) Median
C) Mode
D) Any of the above

108. In a set of observations, the observation that occurs the most often iscalled
A) Mean
B) Median
C) Mode
D) Any of the above

109. Find the value of: 2^5
A) 32
B) 64
C) 8
D) 16

110. Express each of the following numbers using exponential notation:
729

A) 3^6
B) 2^{10}
C) 7^3
D) 9^3

111. Simplify:

$5^2 + 4^3 + 2^4 + 1^5$

A) 106
B) 500
C) 985
D) 178

112. Using laws of exponents, simplify:

$$\frac{20^{16} \div 20^4}{20^{10}}$$

A) 400
B) 600
C) 900
D) 800

113. Simplify : $\frac{(50^2)^2}{(25\times25)^2}$

A) 200

B) 400

C) 600

D) 800

114. Express each of the following as a product of prime factors only in exponential form:

80

A) $2 \times 3 \times 5$

B) $2 \times 2^3 \times 5$

C) $2 \times 2 \times 5$

D) $2 \times 25 \times 5$

115. Write the following numbers in the expanded forms:$(9\times10^4) + (6\times10^3) + (0\times10^{11}) + (3\times10) + (5\times10^0)$

A) 96035

B) 96045

C) 8645

D) 9604

116. Scarlet ate $\frac{4}{5}$ part of an apple and the remaining apple was eaten by her brother Bruce. How much part of the apple did Bruce eat ?

$A)\ \frac{1}{5}$

B) 0

C) $\frac{3}{2}$

D) $\frac{4}{5}$

117. A car runs 24 km using 1 litre of petrol. How much distance will it cover using $2\frac{3}{4}$ litres of petrol?

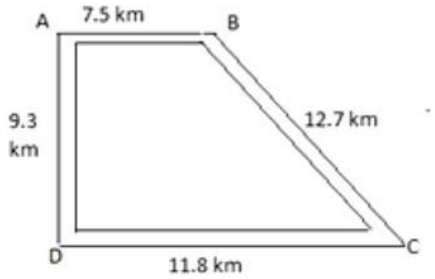
A) 67 km

B) 66 km

C) 42 km

D) 65 km

118. Robert went from place A to place B and from there to place C. A is 7.5km from B and B is 12.7 km from C. Kevin went from place A to place Dand from there to place C. D is 9.3 km from A and C is 11.8 km from D Who travelled more and by how much?



A) Kevin travelled more by 09 km
B) Kevin travelled more by 90.0m
C) Kevin travelled more by 0.9 km
D) Kevin travelled more by 0.09 km

119. If x = 4, y = 2, z = 1, find the value of

$$\frac{3x - 4y + z}{2x + y + z}$$

A) 11/5
B) 5/10
C) 5/11
D) None of the above

120. Find the value of $x - 2y + \frac{x}{y} + 1$, when x = 4, y = -2,

A) 7
B) 7.3
C) 7.03
D) 3.1

121. Subtract: (5a – 5b) from (7a + b).

A) 4a – 6b
B) 12a + 6b
C) 2a +6b
D) 3a + 6b

122. If a = 1, b = 2, and c = 3. Find the value of

$$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$$

A) 2
B) 6
C) 9
D) 8

123. Multiply
(3a + 4b + 1c) by (a – b + c).

A) $3a^2$ + ab + 4ac – $4b^2$ +5 bc + c^2
B) $3a^2 + ac + c^2$ - 7ab - $4b^2$
C) $2a^2$ + ab + 8ac – $3b^2$ – bc + $4c^2$
D) $2a^2$ + ab + 6ac – $3b^2$ – bc + $6c^2$

124. Express the following number using exponential notation:1024

A) 2^5
B) 2^{10}
C) 9^2
D) 10^2

125. Simplify:

$(3^3) \times (10^4)$

A) 2700
B) 27000
C) 270000
D) 2700000

• ANSWER KEY

QUESTION NO.	ANSWER
1	D
2	D
3	B
4	A
5	B
6	A
7	B
8	A
9	C
10	D
11	C
12	C
13	B
14	A
15	B
16	A
17	A
18	D
19	D
20	B
21	D
22	B
23	A
24	B
25	A
26	D
27	B
28	A
29	A
30	A
31	C
32	C
33	C
34	A
35	A
36	A
37	A
38	A
39	D
40	A

QUESTION NO.	ANSWER
41	A
42	B
43	A
44	C
45	C
46	D
47	A
48	C
49	C
50	A
51	A
52	D
53	B
54	A
55	C
56	A
57	B
58	B
59	A
60	A
61	D
62	C
63	B
64	B
65	B
66	D
67	C
68	D
69	C
70	C
71	D
72	B
73	C
74	C
75	C
76	A
77	B
78	A
79	C
80	B

• ANSWER KEY

QUESTION NO.	ANSWER
81	B
82	D
83	A
84	A
85	C
86	C
87	C
88	A
89	A
90	D
91	C
92	C
93	B
94	D
95	B
96	B
97	A
98	D
99	B
100	C
101	A
102	A
103	B
104	A
105	C
106	A
107	C
108	C
109	A
110	D
111	A
112	A
113	B
114	B
115	A
116	A
117	C
118	C
119	C
120	A

QUESTION NO.	ANSWER
121	C
122	B
123	B
124	B
125	C