CBSE EXAMINATION PAPER-2022

MATHEMATICS

(Solved)

Time allowed : 3 hours | Maximum Marks : 43

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **18 questions.** All questions are **compulsory.**

ii. This question paper is divided into **4 sections.**

iii. **Section A** – questions number **1 to 2** are case based questions

iv. **Section B** – questions number **3 to 10** are very short answer

v. **Section C** – questions number **11 to 15** are short answer

vi. **Section D** – questions number **16 to 18** are long answer

vii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

viii. Use of calculator is NOT allowed.

Section A

Question 1.

Kite festival

Kite festival is celebrated in many countries at different times of the year. In India, every year 14th January is celebrated as International Kite Day. On this day many people visit India and participate in the festival by flying various kinds of kites.

The picture given below, shows three kites flying together.

In Fig. 5, the angles of elevation of two kites (Points A and B) from the hands of a man (Point C) are found to be 30° and 60° respectively. Taking AD =50 m and BE = 60 m, find

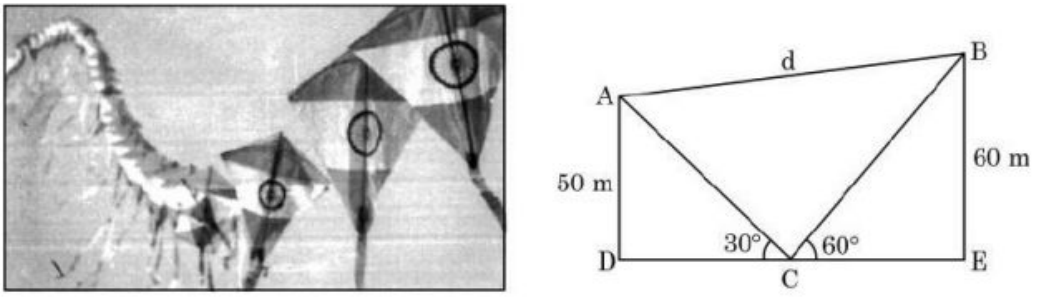


Fig. 5

(1)

the lengths of strings used (take them straight) for kites A and B as shown in the figure.

[2 Marks]

(2)

the distance 'd' between these two kites

[2 Marks]

Question 2.

A 'circus' is a company of performers who put on shows of acrobats, clowns etc. to entertain people started around 250 years back, in open fields, now generally performed in tents.

One such 'Circus Tent' is shown below.

The tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of cylindrical part are 9 m and 30 m respectively and height of conical part is 8 m with same diameter as that of the cylindrical part, then find



(1)

the area of the canvas used in making the tent;

[3 Marks]

(2)

the cost of the canvas bought for the tent at the rate Rs 200 per sq m, if 30 sq m canvas was wasted during stitching.

[1 Marks]

Section B

Question 3.

Solve the quadratic equation: $x^2 + 2\sqrt{2}x - 6 = 0$ for x.

[2 Marks]

Question 4.

Which term of the AP -11/ 2, -1 / 2,..... is 49 / 2?

[2 Marks]

Question 5.

Find a and b so that the numbers a,7,b,23 are in A.P.

[2 Marks]

Question 6.

A solid piece of metal in the form of a cuboid of dimensions 11 cm × 7 cm × 7 cm is melted to form 'n' number of solid spheres of radii 7 / 2 cm each. Find the value of n.

[2 Marks]

Question 7.

In Fig. 1, AB is diameter of a circle centered at O. BC is tangent to the circle at B. If OP bisects the chord AD and ∠AOP = 60°, then find m∠C.

[2 Marks]

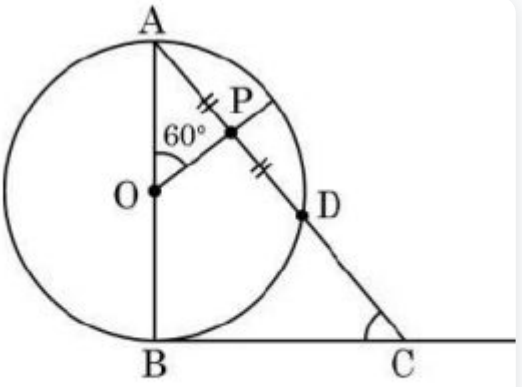


Fig. 1

Question 8.

In Fig. 2, XAY is a tangent to the circle centered at O. If ∠ABO = 40°, then find m∠BAY and m∠AOB.

[2 Marks]

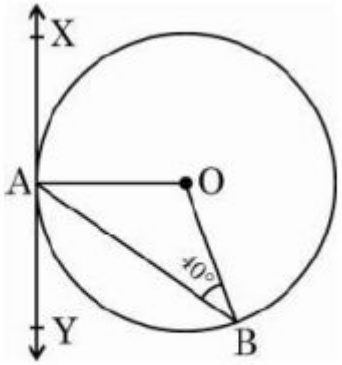


Fig. 2

Question 9.

If mode of the following frequency distribution is 55, then find the value of x.

[2 Marks]

Class :	0 – 15	15 – 30	30 – 45	45 – 60	60 – 75	75 – 90
Frequency :	10	7	x	15	10	12

Question 10.

Find the sum of first 20 terms of an A.P. whose n^{th} term is given as a_n=5-2n.

[2 Marks]

Section C

Question 11.

Draw two concentric circles of radii 2 cm and 5 cm. From a point on the outer circle, construct a pair of tangents to the inner circle.

[3 Marks]

Question 12.

In Fig. 3, AB is tower of height 50 m. A man standing on its top, observes two cars on the opposite sides of the tower with angles of depression 30° and 45° respectively. Find the distance between the two cars.

[3 Marks]

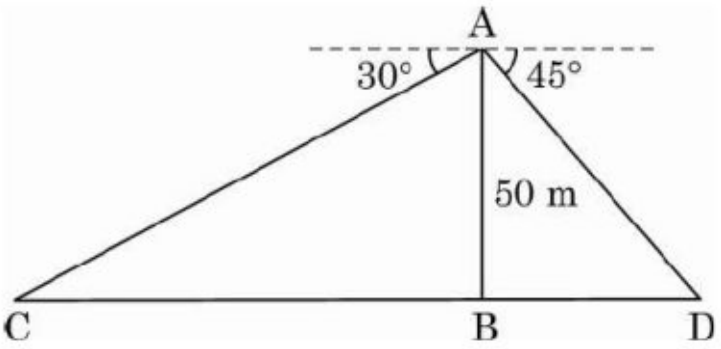


Fig. 3

Question 13.

The mean of the following frequency distribution is 25. Find the value of f.

[3 Marks]

Class :	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency :	5	18	15	f	6

Question 14.

Find the mean of the following data using assumed mean method :

[3 Marks]

Class :	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency :	8	7	10	13	12

Question 15.

Heights of 50 students of class X of a school are recorded and following data is obtained :

Find the median height of the students.

[3 Marks]

Height (in cm) :	130-135	135-140	140-145	145-150	150-155	155-160
Number of Students :	4	11	12	7	10	6

Section D

Question 16. In Fig. 4, PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q meet at a point T. Find the length of TP.

[4 Marks]

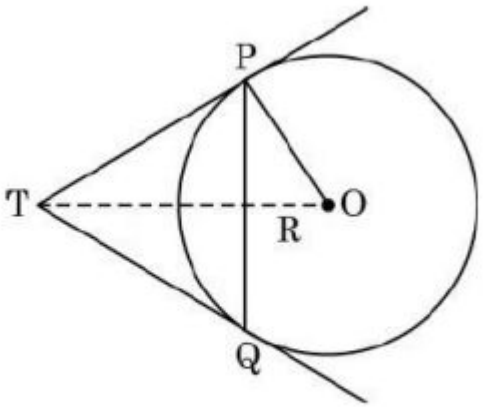


Fig. 4

Question 17. A 2-digit number is such that the product of its digits is 24. If 18 is subtracted from the number, the digits interchange their places. Find the number.

[4 Marks]

Question 18.

The difference of the squares of two numbers is 180. The square of the smaller number is 8 times the greater number. Find the two numbers.

[4 Marks]