SECTION A

[40 marks]

*Answer **all** the questions in this section. All questions carry equal marks.*

1.

Monica rode a bicycle for 45 minutes and walked for an hour to cover a total distance of 10.4 km. If the riding speed is 3 times the walking speed, find, correct to two significant figures, the

(a) walking speed;

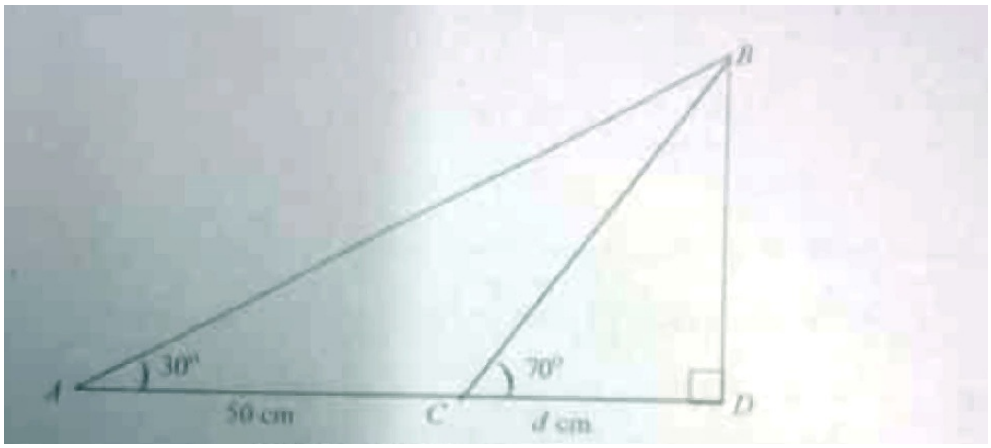
(b) distance travelled by riding.

2.

In the diagram, ABD is a triangle, |AC| = 50 cm and |CD| = *d* cm. Find, correct to one decimal place,

(a) the value of *d*;

(b) |BD|.



NOT DRAWN TO SCALE

3.

A man travels 4 km from a point I on a bearing of 135° to J. He continues 13 km on a bearing of 015° to K.

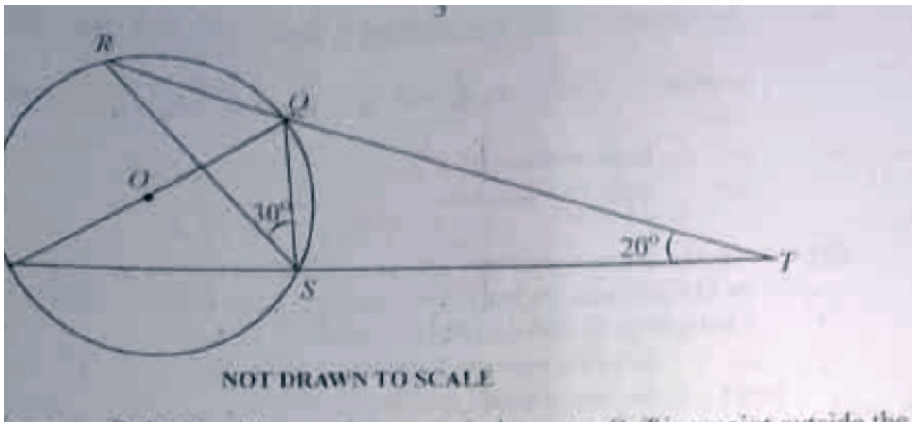
(a) Illustrate the information in a diagram.

(b) Find

(i) correct to two significant figures, |JK|;

(ii) the bearing of K from I.

4.



NOT DRAWN TO SCALE

In the diagram, P, R, Q and S are points on a circle centre O. T is a point outside the circle such that ∠RTP = 20°, ∠QSR = 30° and PQ is a diameter. Calculate:

(a) ∠QRS;

(b) ∠POS.

5.

The mean age, in years, of *t* girls in a class was 17.6. At the end of the academic year, 4 girls aged 16, 19, 20 and 17 were dismissed. The new mean age of girls in the class became 0.2 less than the original mean. Find the value of *t*.

SECTION B

[60 marks]

*Answer **five** questions only from this section. All questions carry equal marks.*

6.

(a)

Two towns, U and V on the equator are on longitude 67°E and 123°E respectively.

(i) Illustrate the information in a diagram.

(ii) Find the distance between U and V along the equator.

(iii) How far is U from the North pole?

[Take R = 6 400 km and $\pi = 22/7$]

(b)

L(2, –1), M(3, 5), N(–1, 6) are the coordinates of the vertices of triangle LMN. Find, correct to one decimal place, the perimeter of the triangle.

7.

(a)

The time a man takes to paint a room alone is an hour less than the time his apprentice takes to paint the same room. If both of them take 72 minutes to paint the room, find the time that the apprentice takes to paint the room alone.

(b)

The angle of elevation of the top of a tower from the top of a building, 5 m high is 30°. If, on the horizontal ground, the building is 40 m away from the foot of the tower.

(i) Illustrate the information in a diagram.

(ii) Calculate, correct to three significant figures, the height of the tower.

8.

(a)

A company bids for two contracts G and H. The probabilities that it will win contracts G and H are 1/5 and 1/6 respectively. Find the probability that the company wins

(i) both contracts;

(ii) only one contract.

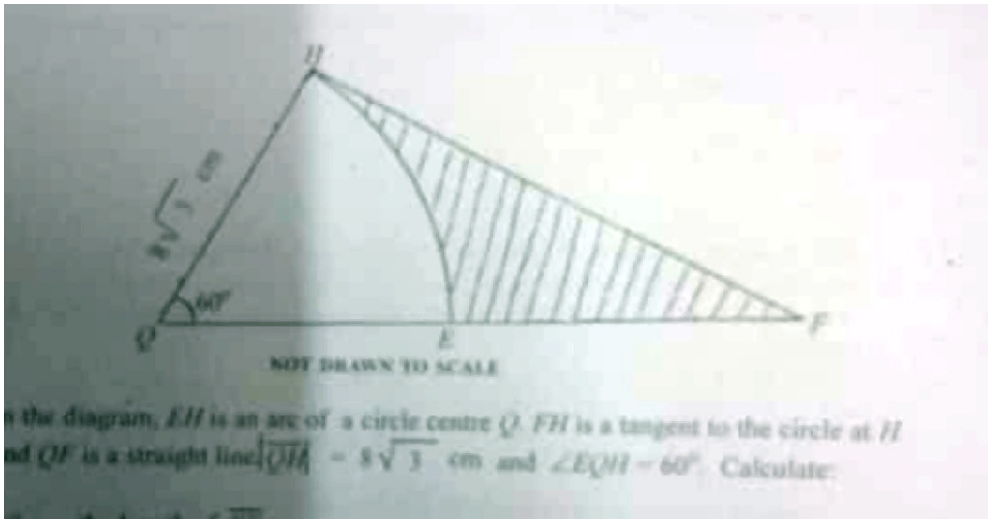
(b)

Amanda drives a car from Samosa to Manpasand at an average speed of 60 km/h in 15 minutes. On her return journey, she took 3 minutes less to arrive at Samosa. Find, correct to one decimal place, the:

(i) distance between Samosa and Manpasand;

(ii) the return speed.

9.



NOT DRAWN TO SCALE

In the diagram, EF is an arc of a circle centre Q. FH is a tangent to the circle at H and QF is a straight line. |QM| = 8√3 cm and ∠EQH = 60°. Calculate:

(a) the length of EF;

(b) correct to three significant figures, the area of the shaded portion.

[Take π = 22/7]

10.

(a)

At a sports festival, the number of individuals who like football is thrice the number who like basketball. Those who like both games is one-third those who like basketball.

(i) Illustrate the information in a Venn diagram.

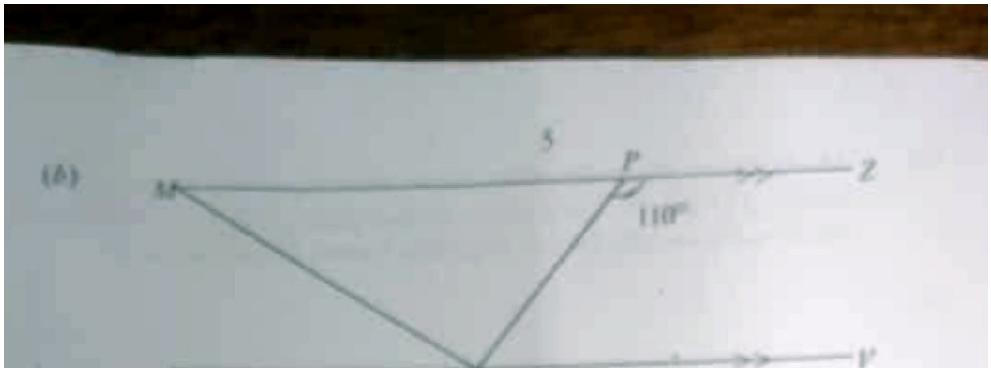
(ii) If 139 out of the 182 persons at the festival did not like any of the two games, find the number of persons who like:

(α) football;

(β) basketball;

(γ) both types of game only.

(b)

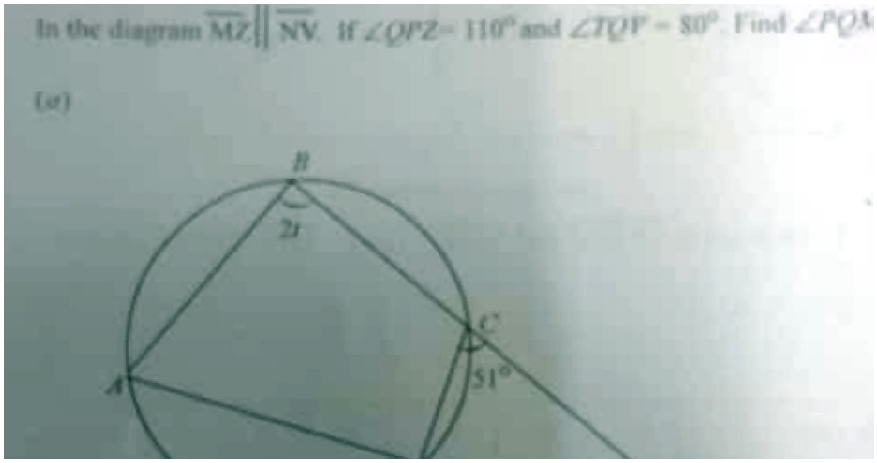


NOT DRAWN TO SCALE

In the diagram, MZ parallel to NV. If ∠QPZ = 110° and ∠TQP = 50°. Find ∠PQM.

11.

(a)



NOT DRAWN TO SCALE

In the diagram, ABCD is a cyclic quadrilateral. BC and AD are produced to meet at E. ∠ABC = 2y, ∠CEF = 5y and ∠DCE = 51°. Find

(i) the value of *y*;

(ii) ∠ADC.

(b)

The graph of the relation $y = x^2 + ax + b$, where *a* and *b* are constants, cuts the *x*-axis at 3 and the *y*-axis at 6.

(i) Find the values of *a* and *b*.

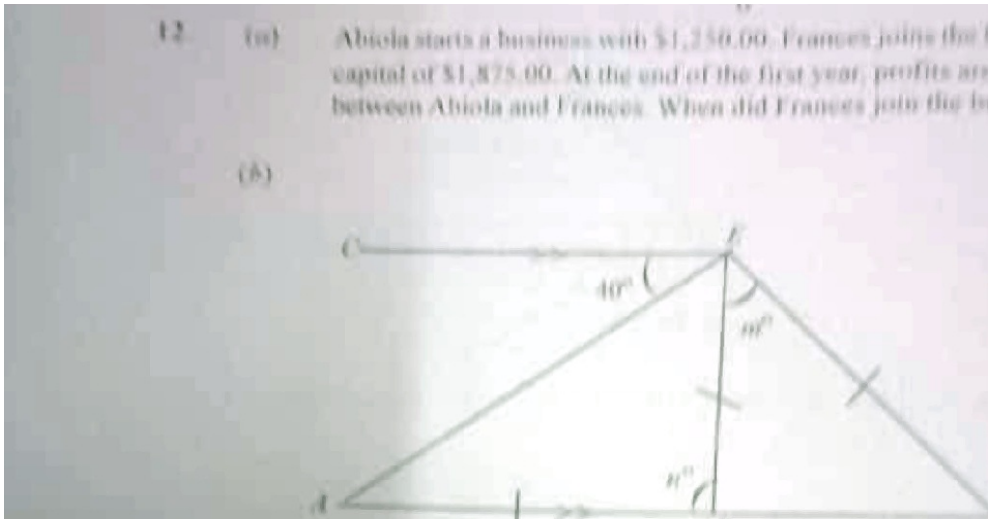
(ii) Use the values of *a* and *b* to solve $x^2 + ax + b = 0$.

12.

(a)

Abiola starts a business with $1 250.00. Frances joins the business later with capital of $1 875.00. At the end of the first year, profits are shared equally between Abiola and Frances. When did Frances join the business?

(b)



NOT DRAWN TO SCALE

In the diagram, CE parallel to AD and |ED| = |EB| = |AB|. Find the value of

(i) *n*;

(ii) *m*.

13.

Height (m)	9	10	11	12	13	14
Number of buildings	5	4	6	5	6	4

The table shows the height (m) of 30 selected buildings in a town.

(a) Find the mean height of the buildings.

(b) Calculate, correct to one decimal place, the

(i) median;

(ii) mean deviation.

END OF PAPER