SECTION A
[40 marks]

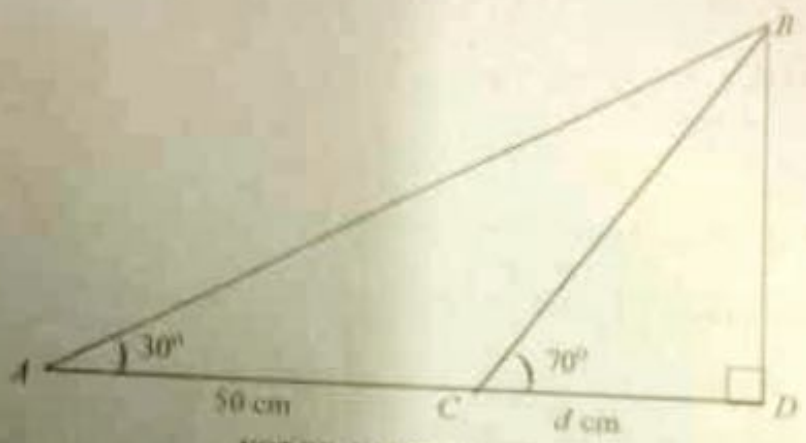
Answer **all** *the questions in this section.* **All** *questions carry* **equal** *marks.*

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.



NOT DRAWN TO SCALE

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

(*a*) the value of *d*;

(*b*) $|\overline{BD}|$

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 045° to K.**

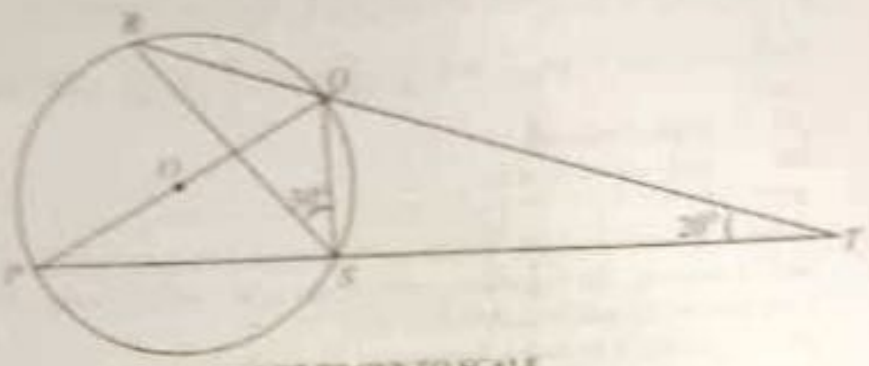
(*a*) **Illustrate the information in a diagram.**

(*b*) *Find*

(i) **correct to two significant figures,** $|\overline{IK}|$;

(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 $\angle RTP = 20°$, $\angle QSR = 30°$ and $\overline{PQ}$ is a diameter. Calculate:

(a) $\angle QRS$;

(b) $\angle PQR$.

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 $\pi = \frac{22}{7}$]

   (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 $\frac{1}{5}$ and $\frac{3}{8}$ respectively. Find the probability that the company wins:

(i) **both** contracts;

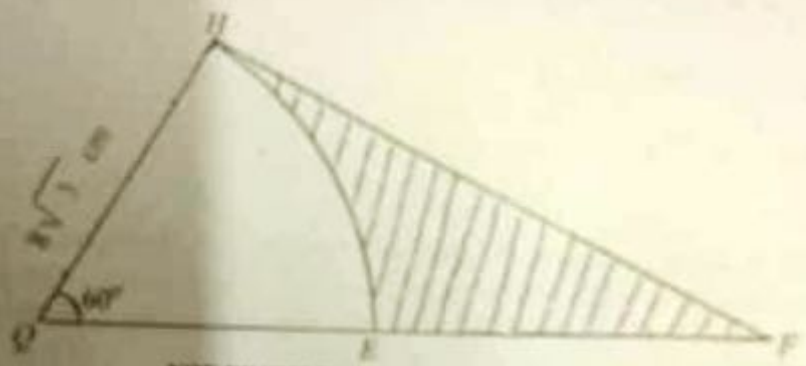
(ii) **only one** contract.

(b) Amaka drove a car from Samoa to Mepeasem at an average speed of 60 km/h in 135 minutes. On her return journey, she took 3 minutes **less** to arrive at Samoa. Find correct to **one** decimal place the:

(i) distance between Samoa and Mepeasem;

(ii) the return speed.

9.



NOT DRAWN TO SCALE

In the diagram, EH is an arc of a circle centre Q. FH is a tangent to the circle at H and QF is a straight line. $|\overline{QH}| = 8\sqrt{3}$ cm and $\angle EQH = 60°$. Calculate:

(a) the length of $\overline{EF}$;

(b) correct to **three** significant figures, the area of the shaded portion.
[Take $\pi = \frac{22}{7}$]

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.

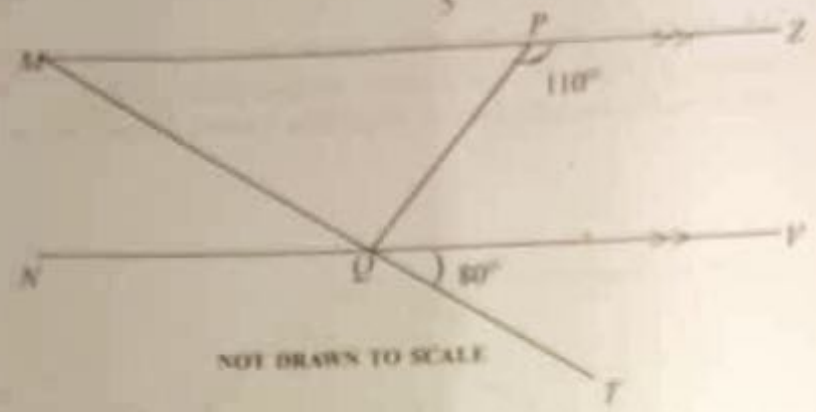
(i) Illustrate the information in a Venn diagram.

(ii) If 139 out of the 1,342 persons at the festival did **not** like **any** of the two games, find the number of persons who like:

(α) football;

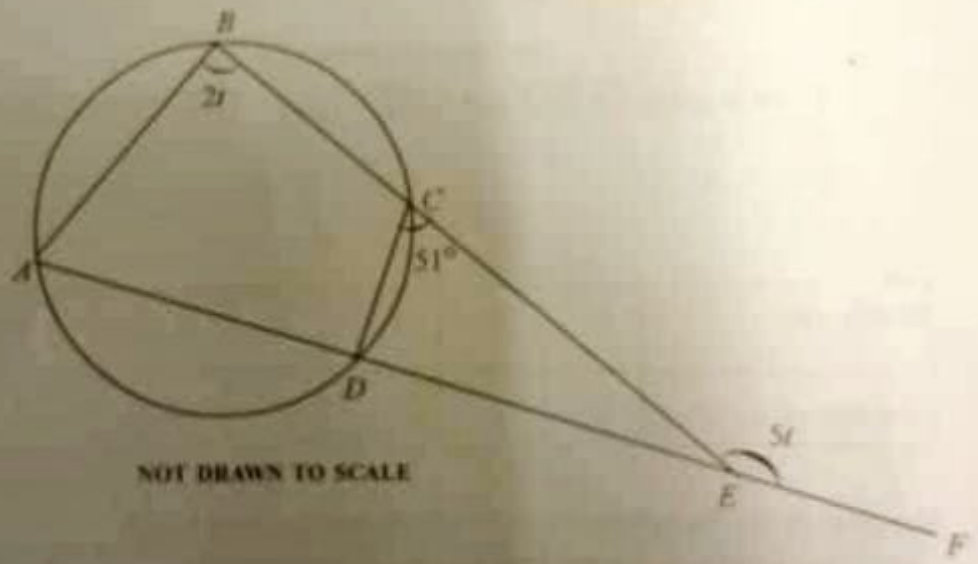
(β) **one type of game only**.

(b)



In the diagram $\overline{MZ} \parallel \overline{NV}$. If $\angle QPZ = 110°$ and $\angle TQV = 80°$. Find $\angle PQM$.

11. (a)



In the diagram, $ABCD$ is a cyclic quadrilateral. $\overline{BC}$ and $\overline{AD}$ are produced to E. $\angle ABC = 2t$, $\angle CEF = 5t$ and $\angle DCE = 51°$. Find

(i) the value of t,

(ii) $\angle ADC$.

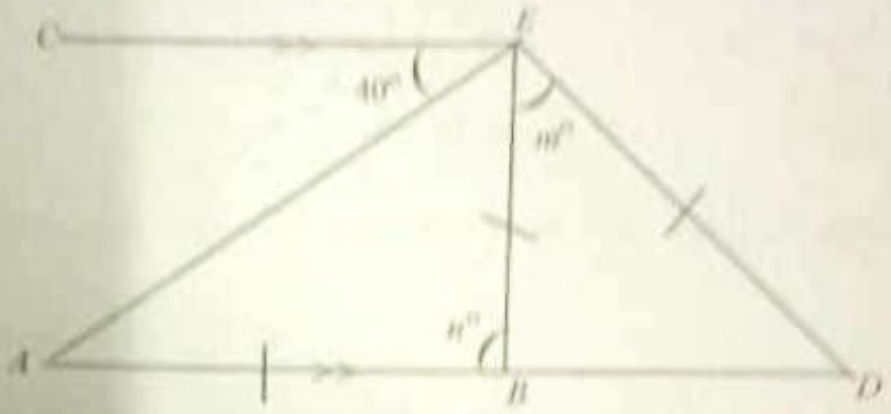
(b) The graph of the relation $y = x^2 + ax + b$, where a and b are constants, cuts the x axis at 3 and the y axis at 6.

(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 a 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, $\overline{CE} \parallel \overline{AD}$ and $|\overline{ED}| = |\overline{EB}| = |\overline{AB}|$. 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