

(i) Workers in a certain company recorded the number of children they had as follows

+	+	+	+	+
+	+	+	+	+
+	+	+	+	+
+	+	+	+	+
+	+	+	+	+

- Draw a frequency table to represent this distribution.
- Find the median.
- Determine the mean.

(ii)

Number of pens	13	26	18	y
Colour	Red	Blue	Black	Green
Angle of sector	72°	x	108°	z

The above table was used to draw a pie chart representing colours of pens in a certain packet.

- Calculate the values of x , y and z .
- Determine the ratio number of pens.
- Find the probability that a pen taken out at random is either red or black.

4. (i) The position vectors of the points A and B are respectively $4i - 3j$ and $-4i + j$, where i and j are unit vectors in the x and y directions respectively.

Determine

- $|OA|$ (leave answer in surd form)
- the value of c given that OA and OB are perpendicular
- the components of C in vector BA
- the coordinates of the point D such that OADB is a rectangle.

(ii)

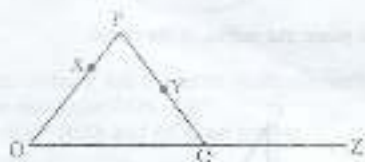


Figure 2

Figure 2 above. X is a point on OP such that $OX = \frac{2}{3} OP$. Y is the midpoint of PQ, and Z is a point on OQ produced such that $OQ = OZ$. Given that $OP = p$ and $OQ = q$, find, in terms of p and q , the vectors

- OY
- XY
- YZ

1. 2. (i) An Urban Council, in one particular year, got its revenue safely by collecting from each vehicle in the area a tax of $\frac{1}{4}$ of its value.

(a) Find the amount of tax that was paid for a car valued at 3.6 million francs.

If the total amount of 8.5 million francs collected by the council, 25% was paid into government treasury, 15% was spent on Medical Care, 30% on Education, 10% on other needs, and the rest on Salaries.

(b) Calculate how much was spent on Education.

The amount spent on Education was shared between Basic and Secondary Education in the ratio 10:7.

(c) Find the amount spent on Basic Education.

(d) Determine how much was spent on Salaries.

(e) State the ratio (in lowest terms) of the amounts distributed to the five headings of expenditure.

- (ii) At the current rate 200 dollars are exchanged for 240 pounds.

(a) Determine the equivalent of one pound in dollars.

(b) Find how many dollars would be exchanged for 13 000 pounds.

2. (i) The functions f and g are defined on $(-\infty, \infty)$ set of real numbers, as follows:

$$f: x \rightarrow 5\sqrt{x} - 2,$$

$$g: x \rightarrow x^2 + 1.$$

(a) Evaluate $f(-1)$.

(b) Determine $f^{-1}(3)$.

(c) Find the value of $g^{-1}(9)$.

- (ii) Sixty students in a hostel can either play the games Monopoly (M), Scrabble (S) and Cards (C). Figure 1 below shows the number of students in each region of the Venn diagram.

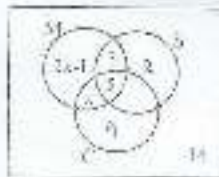


Figure 1

Given that $n(M) = 38$, four students play only cards, and that two and one play only at scrabble,

- determine the value of x ,
- determine how many play only cards and scrabble,
- find the number who play scrabble,
- describe, in simple everyday English, the set $(C \cap M) \cap S$,
- In a sketch Venn diagram, shade the region represented by $(C \cap M) \cap S$.

5. (i)

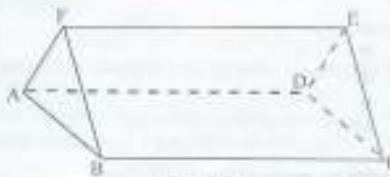


Figure 3

- (a) Determine the ratio
faces: edges: vertices
- (b) Calculate, to two decimal places, the volume of the prism.
- (c) Find, to two significant figures, the total surface area of the prism.
- (d) The prism is melted down and cast into a solid cube. Calculate the length of the side of the cube, to one decimal place.

- (ii) The sum of the first four terms of an arithmetic progression is 16. The sum of the seventh and eighth terms is -12.
Find the first term and the common difference of the progression.

6. (i) Use ruler, pencil and compasses only in this question.

- (a) In the middle of a fresh page, draw the line OX of length 10 cm.
- (b) Construct line OY such that angle XOY = 60° .
- (c) Mark points P and Q on OX such that OP = 3 cm and OQ = 7 cm.
Construct the perpendicular bisector of PQ.
- (d) Bisect angle YOP.
- (e) Construct a circle on the chord PQ with centre T where the two bisectors in (c) and (d) intersect.
- (f) State, to one decimal place, the radius of the circle.

(ii)



Figure 4

A ladder, AC, leaning against a vertical wall (figure 4), makes an angle of 50° with the floor. Given that the distance BA is 2.6 m,
Calculate, to one decimal place,

- (a) the height BC
- (b) the length of the ladder AC.