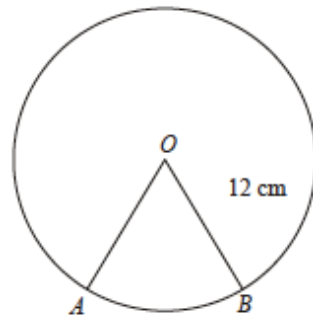


Revision F4 (Topics 11-17) [55]

1. (a) Show that one solution of the equation $x^3 + 10x - 50 = 0$ lies between 2 and 3. (2)
 (b) Find this solution correct to 1 decimal place. (4)
 (Total 6 marks)

2.

AOB is a sector of a circle of radius 12 cm.
 The area of the minor sector AOB is 98 cm^2 .



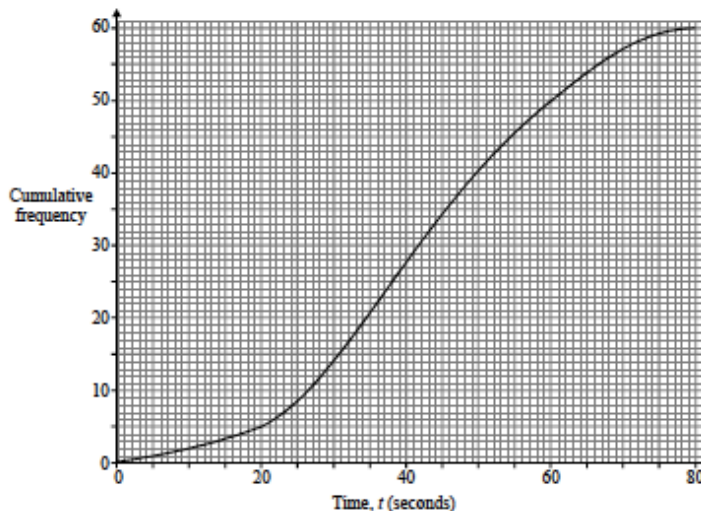
Not drawn accurately

Calculate the size of angle AOB .

(Total 3 marks)

3.

Waheed measures the time taken by each of 60 students to complete a puzzle. The quickest student took 10 seconds and the slowest took 80 seconds. The results are shown on the cumulative frequency diagram.



- (a) Draw a boxplot for these data. (4)
 (b) Find the interquartile range. (1)
 (Total 5 marks)

4.

- (a) Solve the equation $\frac{1}{2}x - 5 = \frac{1}{4}x + 3$ (3)
- (b) (i) Factorise $x^2 + 5x - 14$ (2)
- (ii) Hence solve the equation $x^2 + 5x - 14 = 0$ (1)
 (Total 6 marks)

5.

The membership of a gymnastics club is shown in the two-way table.

	Seniors	Juniors
Girls	10	22
Boys	4	12

The club is given two tickets to watch a competition.

The club chooses two members, at random, to receive these tickets.

Calculate the probability that

(a) two junior girls are chosen,

(2)

(b) the two members chosen are of the same sex.

(3)

(Total 5 marks)

6.

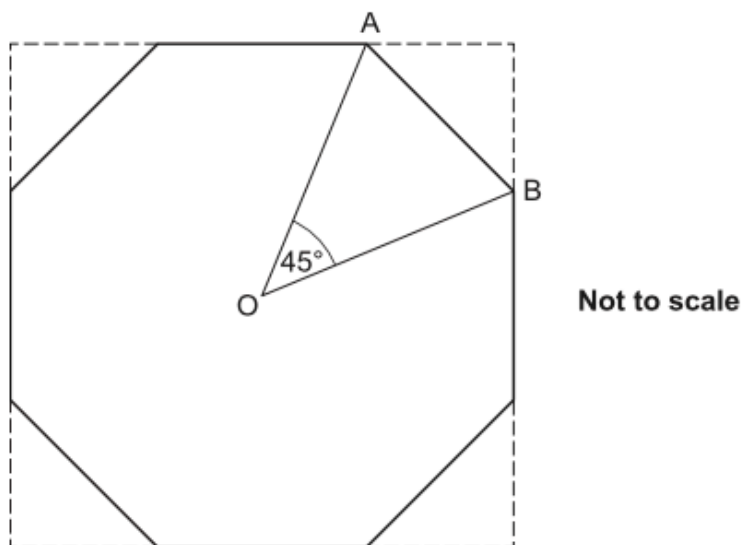
Simon cuts the corners off a square piece of card to leave the regular octagon shown below.

O is the centre of the octagon.

A and B are vertices of the octagon.

$OA = OB = 5\text{ cm}$.

Angle $AOB = 45^\circ$.



(a) (i) Work out the area of the octagon.

(ii) Work out the area of the original square piece of card.

(b) Simon now makes a table top using the card as a model.

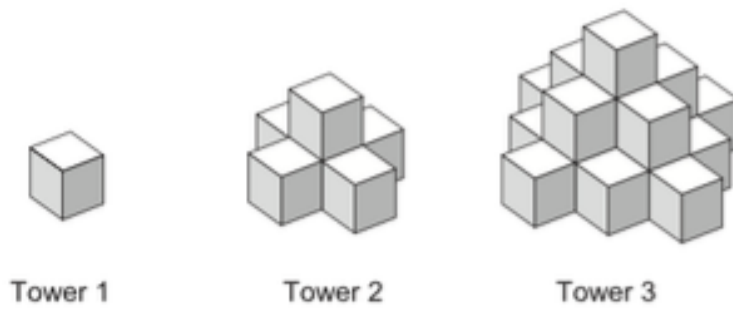
The sides of the table top are 8 times as long as the sides of the card model.

Find the ratio of the area of Simon's table top to the area of the card model.

(Total 10 marks)

7. **Non-calculator**

Here is a picture of three towers.
Not all the cubes can be seen in the towers.



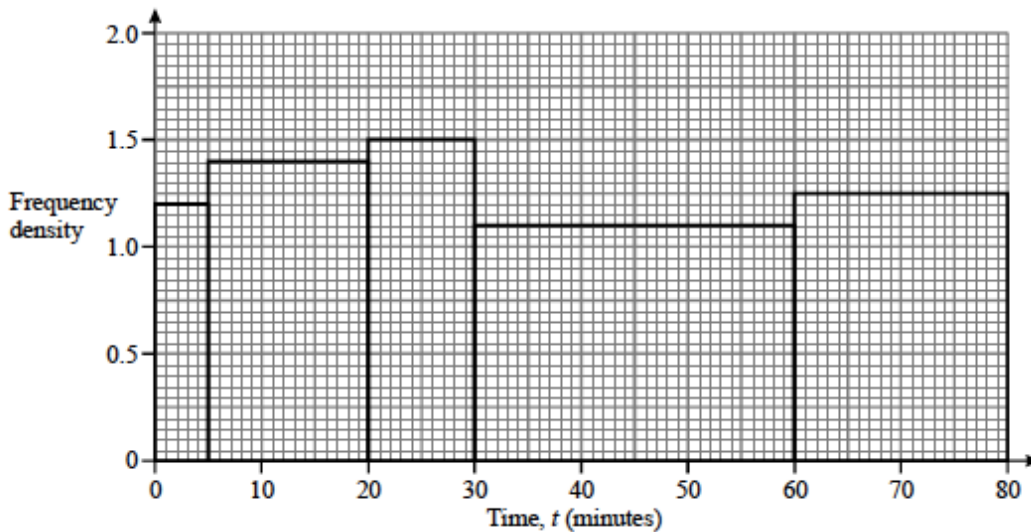
Edith uses 1 cube to build tower 1.
Edith uses 6 cubes to build tower 2. There are 5 cubes on the bottom layer.

- (a) Write down the total number of cubes in tower 3.
- (b) Draw a plan view of the arrangement of cubes Edith will use for the bottom layer of tower 4.
- (c) The number of cubes in Tower 1 and Tower 2 are 1 and 5 respectively. Write down the number of cubes in Tower 3 and Tower 4.
- (d) Find an expression for the number of cubes used in the bottom layer of tower n .

(Total 8 marks)

8.

The histogram shows information about how much time was spent in a supermarket by 100 shoppers.



- (a) Copy and complete this frequency table:

Time, t (minutes)	$0 < t \leq 5$	$5 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 60$	$60 < t \leq 80$
Number of shoppers	6		15		25

(2)

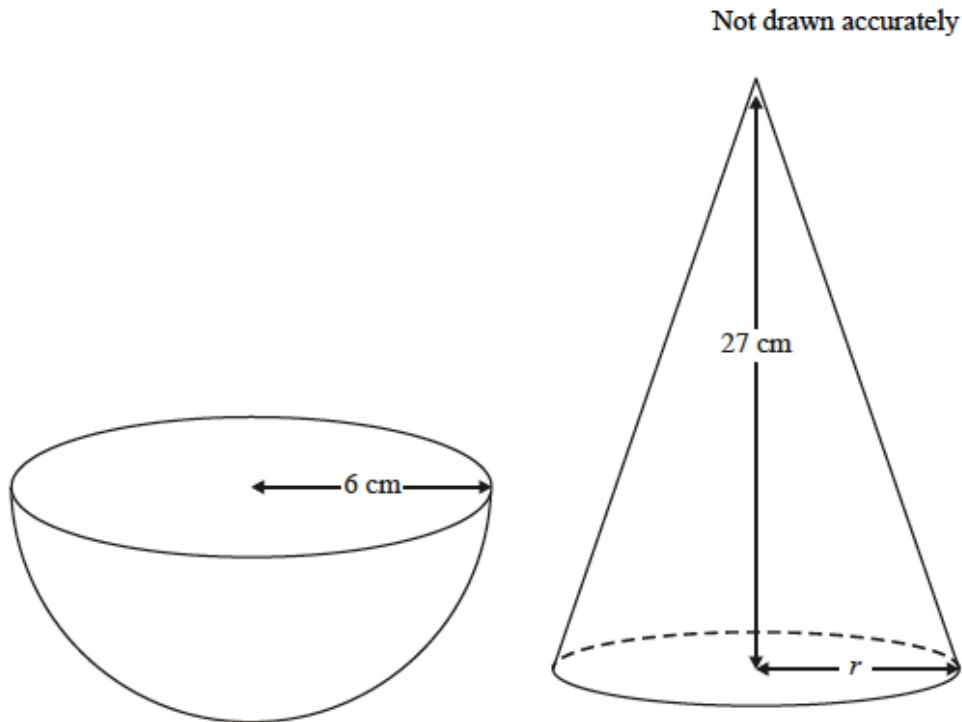
- (b) 20% of the shoppers are in the supermarket for more than T minutes.
Calculate an estimate of the value of T .

(2)

(Total 4 marks)

9.

A hemispherical bowl of radius 6 cm has the same volume as a cone of perpendicular height 27 cm.



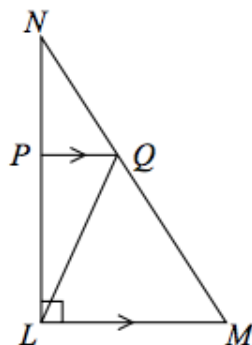
Calculate the base radius, r , of the cone.

(Total 4 marks)

Volume Sphere = $\frac{4}{3}\pi r^3$ where r is the radius
Cone = $\frac{1}{3}\pi r^2 h$ where h is the **perpendicular** height and r is the base radius

10. **Non-calculator**

LMN is a right-angled triangle.



Angle $NLM = 90^\circ$
 PQ is parallel to LM .

The area of triangle PNQ is 8 cm^2
The area of triangle LPQ is 16 cm^2

Work out the area of triangle LQM .

(Total 4 marks)