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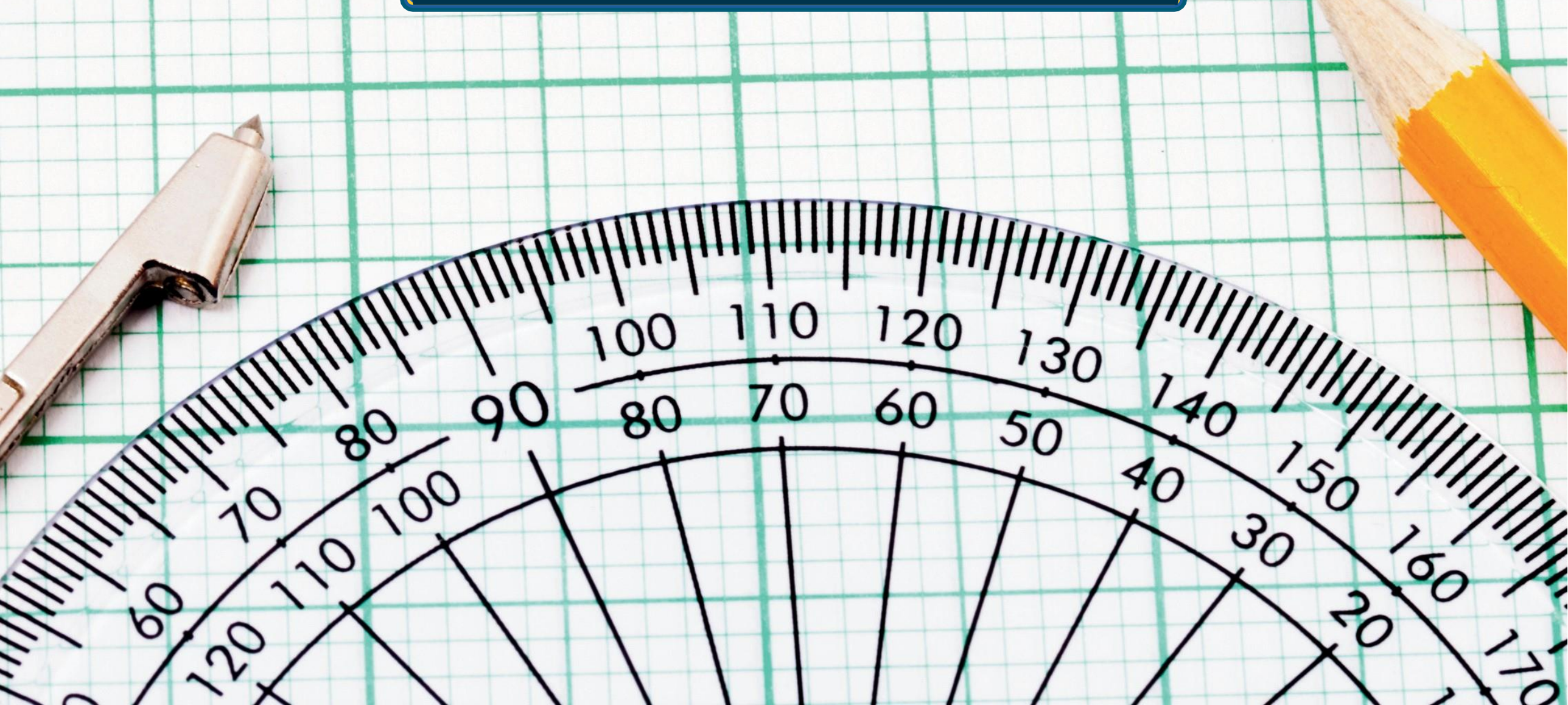
ELEVATE

MATH TOPICAL WORKSHEETS

IGCSE-Int. Mathematics (0607)

Full Portion Mock Test



TEST-PAPER

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

INTERNATIONAL MATHEMATICS **0607/04**

Paper 4 Calculator (Extended)

SPECIMEN PAPER **1 hour 30 minutes**

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly. You will be given marks for correct methods, including sketches, even if your answer is incorrect.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].

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[Turn over

1. Zahur made 250 cakes to sell at a cake sale. Of the cakes made by Zahur, 28% were chocolate cakes.

(a) Calculate the number of chocolate cakes made by Zahur.

[2]

All the other cakes made by Zahur were either lemon cakes or vanilla cakes. The ratio of the number of lemon cakes to the number of vanilla cakes was $4:5$

(b) Calculate the number of lemon cakes made by Zahur.

[2]

Zahur put icing on each of the vanilla cakes he made.
The icing for each vanilla cake needed 75 g of icing sugar.
(c) Calculate the total amount, in kg , of icing sugar needed for all the vanilla cakes made by Zahur.

[2]

At the start of the cake sale, the selling price of each of the cakes made by Zahur was $4 and he sold 204 cakes at this price.

Zahur then reduced the selling price of each cake by 30% and he sold all the remaining cakes.
(d) Calculate the total amount of money, in $, that Zahur received by selling all 250 cakes.

[3]

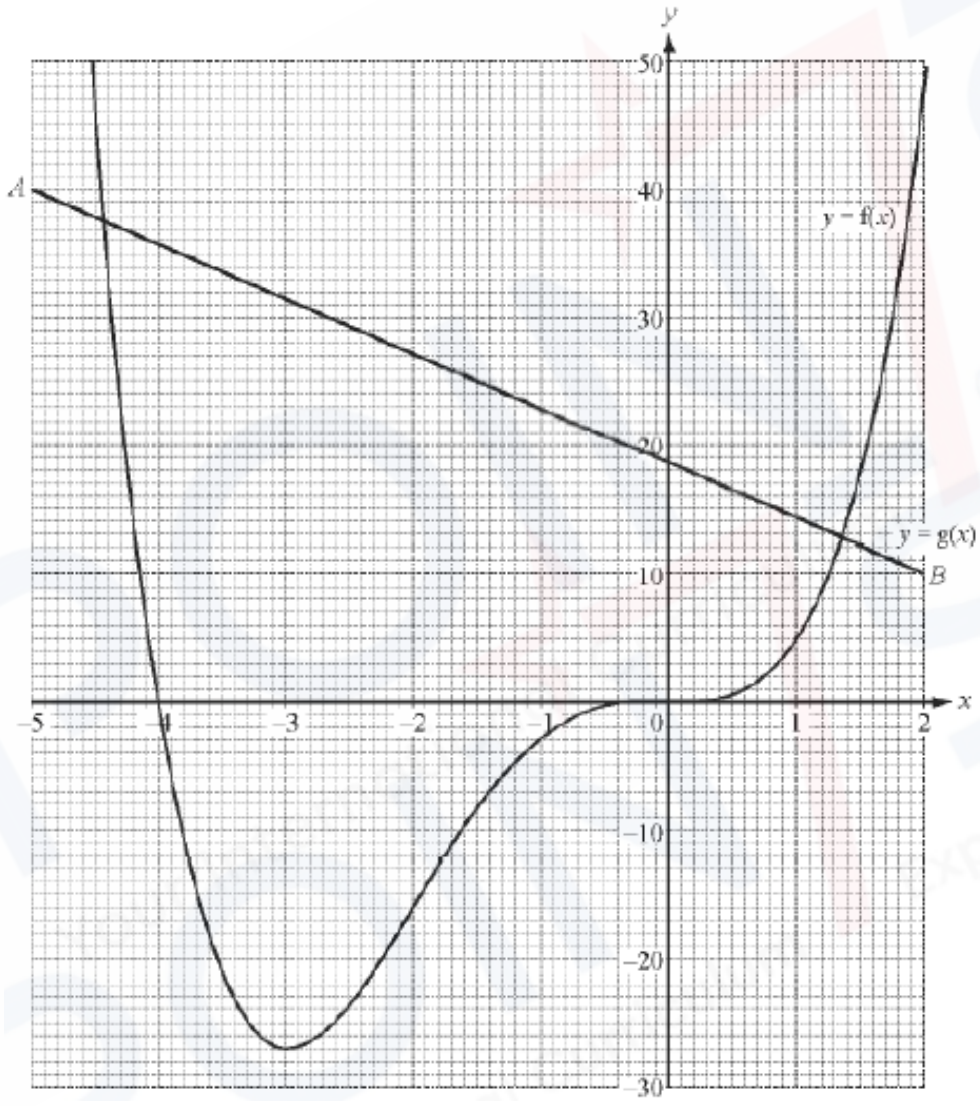
When Zahur had subtracted the cost of all the ingredients he needed to make his cakes from the total amount of money he received by selling all the cakes, he found that he had made a profit of 60%

(e) Calculate, in $, the cost of all the ingredients Zahur needed.

[3]

2. Show that $\left(\frac{6}{x-2}+\frac{4}{x+3}\right)\times\frac{5x^2-15x+10}{x^2-1}$ can be written in the form $\frac{p}{x+q}$ where p and q are integers to be found.

3. [5]



The graphs of $y = f(x)$ and $y = g(x)$ are shown above.

(a) Find the value of

(i) $f(-2)$,

Answer(a)(i) ..... [1]

(ii) $g(0)$.

Answer(a)(ii) ..... [1]

(b) Use the graphs to solve

(i) the equation $f(x) = 20$,

Answer(b)(i) $x =$ ..... or $x =$ ..... [2]

(ii) the equation $f(x) = g(x)$,

Answer(b)(ii) $x =$ ..... or $x =$ ..... [2]

(iii) the inequality $f(x) < g(x)$.

Answer(b)(iii) ..... [1]

(c) Use the points A and B to find the gradient of $y = g(x)$ as an exact fraction.

Answer(c) ... ... [2]

(d) On the grid, draw the graph of $y = g(x) - 10$.

[2]

(e) (i) Draw the tangent to the graph of $y - f(x)$ at $(-3, -27)$.

[1]

(ii) Write down the equation of this tangent.

Answer(e)(ii) ... ... [1]

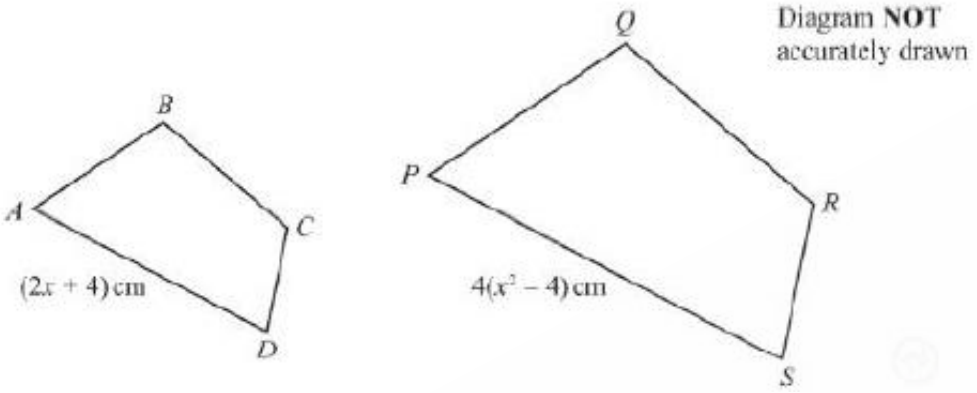
(f) A region, R, contains points whose co-ordinates satisfy the inequalities

$$-3 \leqslant x < -2, y \leqslant 40 \text{ and } y \geqslant g(x).$$

On the grid, draw suitable lines and label this region R.

[2]

4.



$ABCD$ and $PQRS$ are two similar quadrilaterals.
The side AD of length $(2x + 4)$cm is the longest side of quadrilateral $ABCD$.
The side PS of length $4(x^2 - 4)$cm is the longest side of quadrilateral $PQRS$.
The area of the quadrilateral $ABCD$ is 10 cm^2
Show that the area, in cm^2, of the quadrilateral $PQRS$ is $a(x - b)^2$ where a and b are integers to be found.

[4]

5.

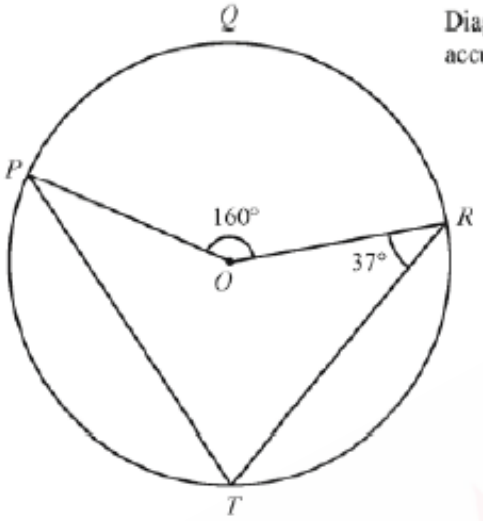


Figure 2 shows the points P, Q, R and T on a circle centre O

$$\angle POR = 160^\circ \ \angle ORT = 37^\circ$$

(a) (i) Work out the size, in degrees, of $\angle PTR$

[1]

(ii) Give a reason for your answer.

[1]

(b) Work out the size, in degrees, of $\angle TPO$

[2]

6. The sector, $OPQR$, is cut out from the circle in Figure 2

A hollow right circular cone is formed by joining OP and OR together as shown in Figure 3

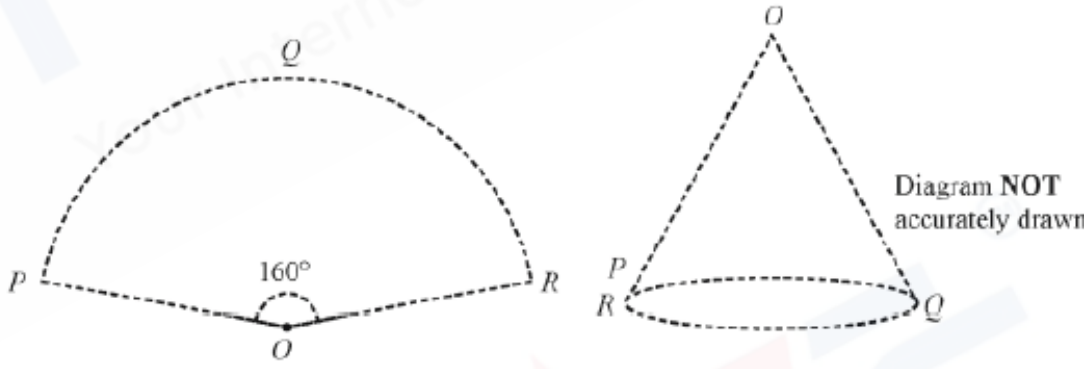


Figure 3

The curved surface area of the cone is $\frac{196}{25}\pi$ cm^2

Calculate the volume, in cm^3 to 3 significant figures, of the cone.

$$\begin{pmatrix} \text{Volume of cone } = \frac{1}{3}\pi r^2 h \\ \text{Curved surface area of cone } = \pi r l \end{pmatrix}$$

[6]

7.

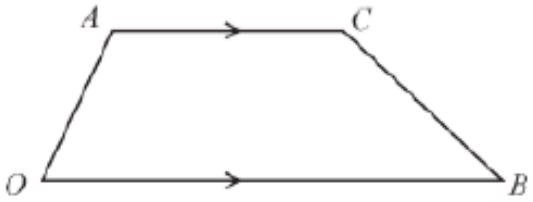


Diagram **NOT** accurately drawn

The diagram shows a trapezium $OACB$ in which

$$\overrightarrow{OA} = \mathbf{a}, \overrightarrow{AC} = 3\mathbf{b}, \overrightarrow{OB} = 5\mathbf{b}$$

The point P lies on OC such that $OP: PC - 5: 1$
D is the point such that OBD is a straight line and APD is a straight line.
Prove that $OB: OD = 1: 3$

[4]

8.

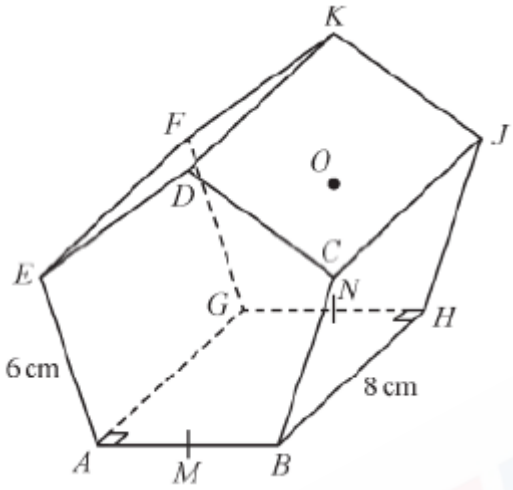


Diagram **NOT** accurately drawn

Figure 5 shows a right prism $ABCDEFGHJK$.

A cross section of the prism is a regular pentagon with sides of length 6 cm .

$BH = 8$ cm.

M is the midpoint of AB.

N is the midpoint of GH.

O is the centre of pentagon $FGHJK$.

(a) Find, in cm to 3 significant figures, the length of AO.

[5]

(b) Calculate the size, in degrees to 1 decimal place, of the angle between MK and MN.

[5]

9.

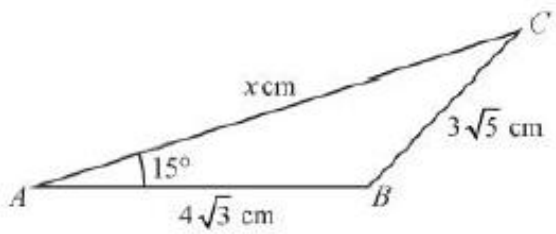


Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows triangle ABC

$$AB = 4\sqrt{3}\text{ cm } BC = 3\sqrt{5}\text{ cm } AC = x\text{ cm } \angle BAC = 15°$$

Given that the exact value of $\cos 15° = \frac{\sqrt{6}+\sqrt{2}}{4}$

(a) show that x is a solution of the equation

$$x^2 - (6\sqrt{2} + 2\sqrt{6})x + 3 = 0$$

[3]

(b) Write the equation given in part (a) in the form $(x-k)^2-21+12\sqrt{3}$ where k is a constant that should be stated as a simplified surd.

[2]

(c) Show that $(3+2\sqrt{3})^2=21+12\sqrt{3}$

Given that $\angle ABC$ is obtuse

[2]

(d) use parts (b) and (c) to find the exact value of x

Give your answer in the form $a + b\sqrt{2} + c\sqrt{3} + \sqrt{d}$ where a, b, c and d are integers.

[3]

10. One Saturday, each of the 100 people who visited a library was asked how long they were in the library.
The table below shows information about the results.

Time (t mins)	Frequency
$0 < t \leqslant 10$	16
$10 < t \leqslant 30$	22
$30 < t \leqslant 35$	10
$35 < t \leqslant 60$	40
$60 < t \leqslant 100$	12

Calculate an estimate for the mean length of time, in minutes to 3 significant figures, these people were in the library.

[5]