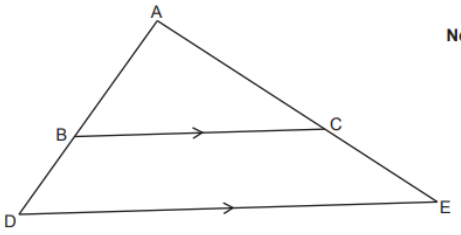
OCR GCSE Mathematics Calculator 2021 Higher Paper 1 Revision Worksheet

Question 11

The diagram shows triangles ABC and ADE.



Not to scale

B lies on AD and C lies on AE.
BC is parallel to DE.

Complete these statements to show that triangles ABC and ADE are similar.

Angle ABC = angle ADE because they are corresponding angles.

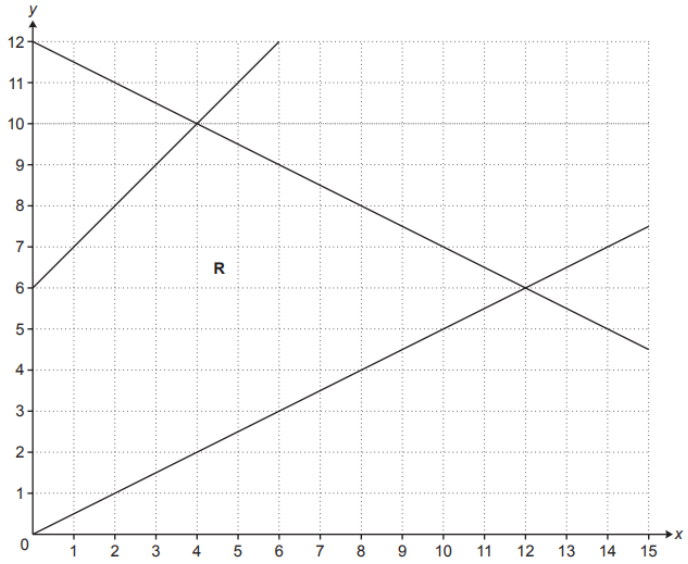
Angle ACB = angle ..... because .....

Angle BAC is .....

Triangles ABC and ADE are similar because .....

.....

Question 12



Region **R** is defined by four inequalities.
One of the inequalities is $x \geqslant 0$.

Use the symbols $\leqslant$ and $\geqslant$ to complete the other three inequalities.

$x \geqslant 0$

y ..... $\frac{1}{2}x$

$x + 2y$ 24

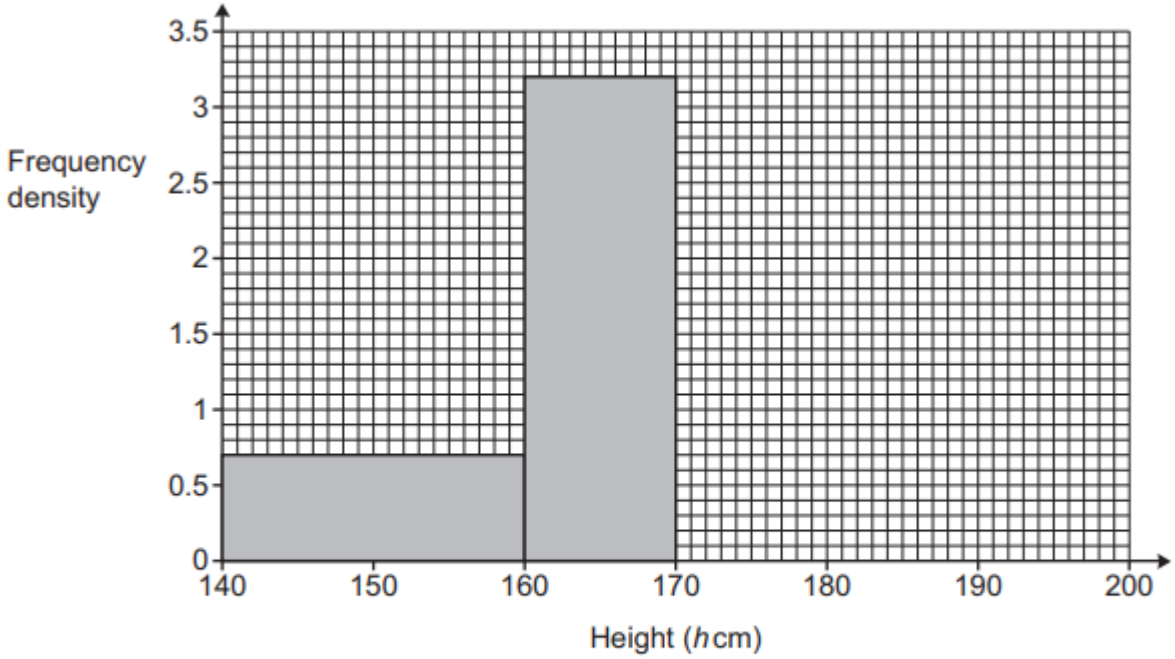
y ..... $x + 6$

(b) The inequality $x \geqslant 0$ is replaced by a new inequality.
Region **R** is then a kite.

Write down the new inequality.

Question 13

The height, $h$cm, of each member of a tennis club is recorded.
The histogram shows some of the results.



40% of the members have a height in the interval $160 \leqslant h < 170$.
30% of the members have a height in the interval $170 \leqslant h < 180$.
100% of the members have a height in the interval $140 \leqslant h < 200$.

Complete the histogram for the intervals $170 \leqslant h < 180$ and $180 \leqslant h < 200$. **[6]**

Question 14

Find the coordinates of the turning point of the graph of $y = x^2 + 6x + 7$.

Complete the square: $y = (x + 3)^2 - 2$ So, the turning point is (-3, -2).

Question 15

The nth term of the quadratic sequence -1, 3, 13, 29 is $an^2 + bn + c$.

Find the values of a, b and c.

Question 16

The formula $P = 6800 \times 1.045^n$ is used to predict the population P of an island n years after 2018.

(a) Write down the population of the island in 2018

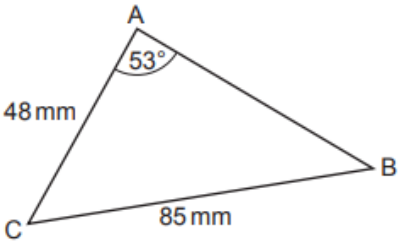
(b) Write down the percentage growth rate used in the formula

(c) (i) Work out the population predicted by the formula for the year 2030.

(ii) Give one reason why the answer to (c)(i) may not be reliable.

Question 17

The diagram shows triangle ABC.



Not to scale

AC = 48 mm, BC = 85 mm and angle BAC = 53°.

Calculate length AB.
You must show your working.

Question 18

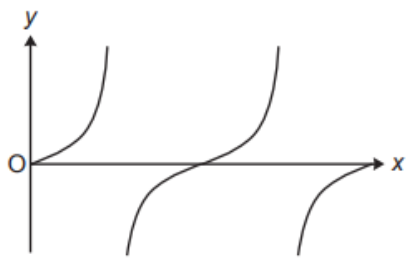
(a) For each graph below, select its possible equation from this list.

$y = x$ $y = x^2$ $y = \frac{1}{x}$

$y = \sin x$ $y = \cos x$ $y = \tan x$

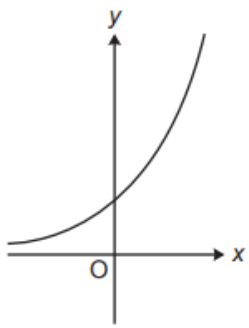
$y = 3^x$ $y = \left(\frac{1}{3}\right)^x$

(i)



(a)(i) $y =$ .....

(ii)



(ii) $y =$ .....