

# 5 hard questions - part 1



Non Calculator

1. Simplify fully  $\frac{2x - 12}{x - 4} \div \frac{2x^2 - 6x - 36}{x^2 - 9x + 20}$

(4 marks)

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Non Calculator

2. Prove algebraically that the straight line with the equation  $x - 2y = 10$  is a tangent to the circle with equation  $x^2 + y^2 = 20$  (4 marks)

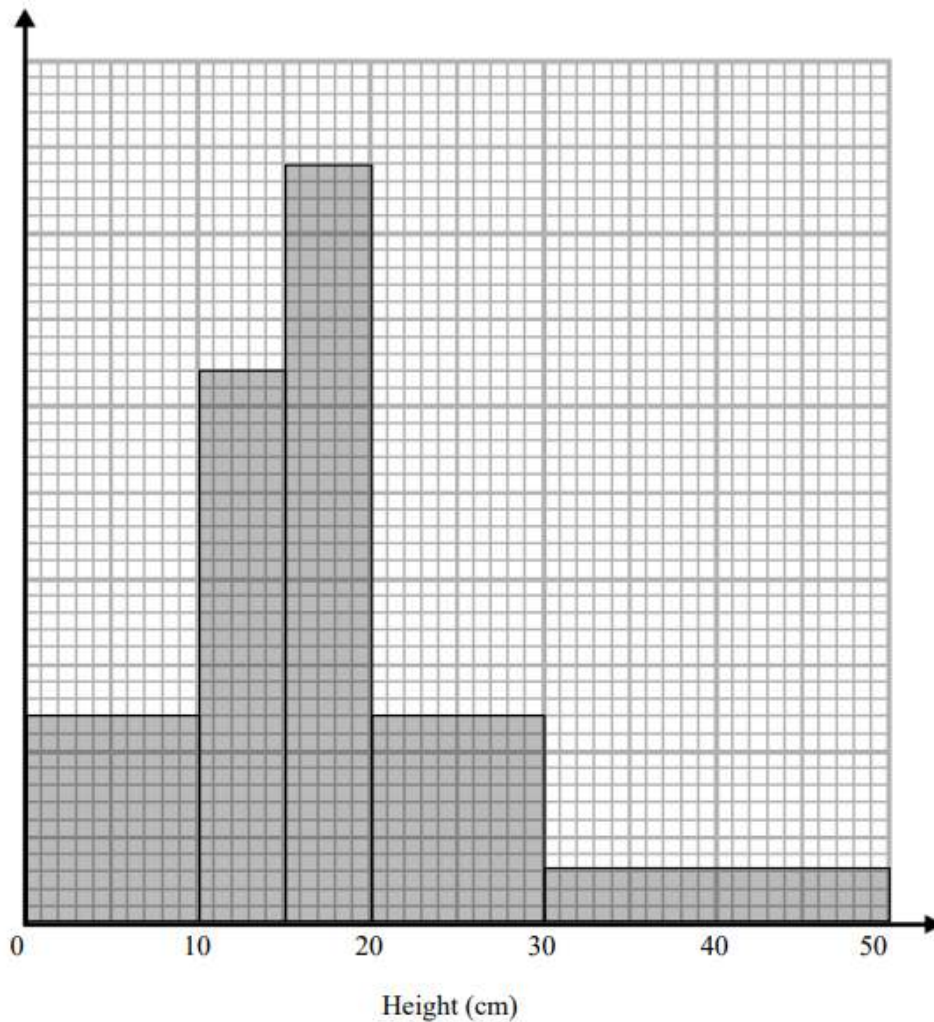
3. The  $n$ th term of a sequence is  $n^2 + 2n + 1$ .  
Two consecutive terms in the sequence have a difference of 13.  
Work out the two terms. (3 marks)

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Non Calculator

4. The histogram shows information about the height of some plants.



(a) Work out an estimate for the number of plants over 25cm tall. (3 marks)

(b) Explain why your answer to part (a) is an estimate (1 mark)

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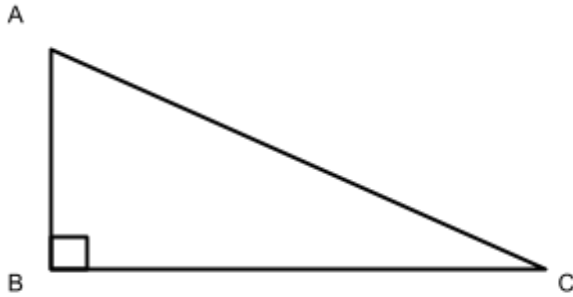
Non Calculator

5. The diagram shows a right angle triangle.

$$AB = \sqrt{5} - 2$$

$$BC = \sqrt{5} + 2$$

All measurements are in m.



Work out, leaving your answers in surd form where appropriate,

(a) the area of the triangle

(2 marks)

(b) the length AC

(3 marks)