

Non-Calculator Questions

Quadratic Equations

Solving Quadratics by Factorising / The Quadratic Formula / Completing the Square
/ Deciding the Quadratic Method

Medium (3 questions)	/8
Hard (3 questions)	/10
Very Hard (4 questions)	/21
Total Marks	/39

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Medium Questions

1 (a) Write $x^2 - 4x + 7$ in the form $(x - a)^2 + b$.

(2 marks)

(b) Write down the coordinates of the turning point of the graph of $y = x^2 - 4x + 7$.

(1 mark)

2 Write $x^2 + 10x + 14$ in the form $(x + a)^2 + b$.

(2 marks)

3 $x^2 + 4x - 9 = (x + a)^2 + b$

Find the value of a and the value of b .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

(3 marks)

Hard Questions

1 i) Write $x^2 + 8x - 9$ in the form $(x + k)^2 + h$.

[2]

ii) Use your answer to **part (i)** to solve the equation $x^2 + 8x - 9 = 0$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

(4 marks)

2 Solve by factorisation $10r^2 - 23r + 9 = 0$.

$r = \dots\dots\dots$ or $r = \dots\dots\dots$

(3 marks)

3 $x^2 - 12x + a = (x + b)^2$

Find the value of a and the value of b .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

(3 marks)

Very Hard Questions

- 1 The solutions of the equation $x^2 + bx + c = 0$ are $\frac{-7 + \sqrt{61}}{2}$ and $\frac{-7 - \sqrt{61}}{2}$.

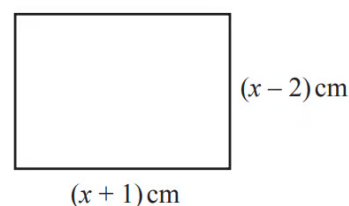
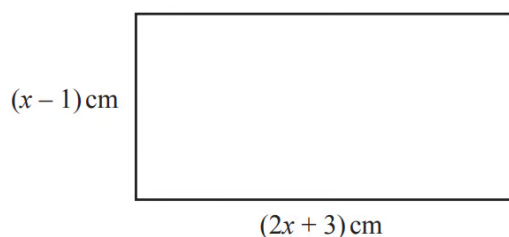
Find the value of b and the value of c .

$b =$

$c =$

(3 marks)

2



NOT TO
SCALE

The difference between the areas of the two rectangles is 62 cm^2 .

- i) Show that $x^2 + 2x - 63 = 0$.

[3]

- ii) Factorise $x^2 + 2x - 63$.

[2]

- iii) Solve the equation $x^2 + 2x - 63 = 0$ to find the difference between the perimeters of the two rectangles.

..... cm [2]

(7 marks)

3

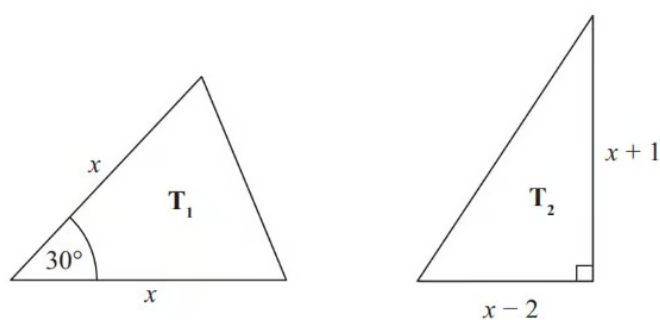


Diagram **NOT**
accurately drawn

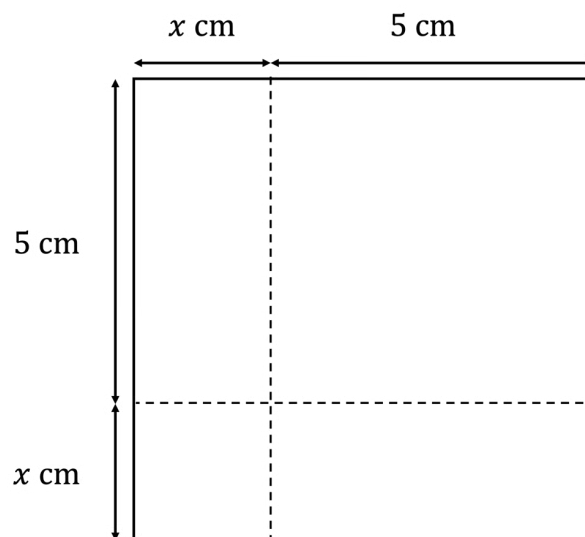
The lengths of the sides are in centimetres.

The area of triangle T_1 is equal to the area of triangle T_2 .

Work out the value of x , giving your answer in the form $a + \sqrt{b}$ where a and b are integers.

(5 marks)

4 (a)



The area of the square above is 30 cm^2 .

Show that $x^2 + 10x = 5$

(3 marks)

(b) Show that the values of x can be written in the form $a + \sqrt{b}$, where a and b are integers.

(3 marks)