

Linear and Quadratic Equations in Context

For AQA Level 2 Certificate in Further Mathematics (8365)

Name _____

Total marks: **26**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

- 1** Circle the solutions of $(x - 4)^2 = 7$

[1 mark]

$x = 4 + \sqrt{7}$ only

$x = 4 \pm \sqrt{7}$

$x = -4 \pm \sqrt{7}$

$x = 11$ and $x = -3$

- 2** Solve $3x^2 - 4x - 9 = 0$

Give your answers to 3 significant figures.

[2 marks]

Answer _____

- 3** Solve $\frac{5k+3}{2k-1} = \frac{9}{4}$

[3 marks]

$k =$ _____

- 4** Before a sale, a coat cost $\pounds(4x + 40)$.
In the sale, the price of the coat is reduced by 20%.
At the same time, the price of a pair of boots is increased by 25%.
Before the increase, the boots cost $\pounds(2x + 48)$.
After these changes, the coat and the boots cost the same.
Work out the price of the coat in the sale.

[3 marks]

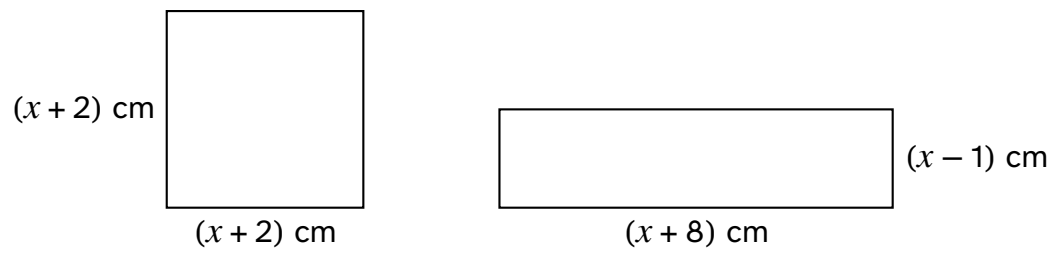
Answer $\pounds$ _____

- 5** A length of rope is cut into two pieces.
The pieces have lengths $(2x + 3)$ metres and $(x + 6)$ metres.
The ratio of the lengths is $(2x + 3) : (x + 6) = 5 : 3$
Work out the length of the rope before it was cut.

[3 marks]

Answer _____ metres

- 6 The diagram shows a square and a rectangle.
The square and the rectangle have the same area.



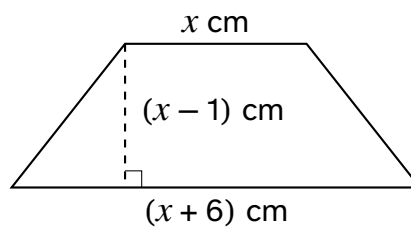
Not drawn accurately

Work out the perimeter of the rectangle.

[3 marks]

Answer _____ cm

- 7 The diagram shows a trapezium.
The area of the trapezium is 30 cm^2 .



Not drawn accurately

- (a) Show that $x^2 + 2x - 33 = 0$

[2 marks]

- (b) Work out the value of x .
Give your answer to 3 significant figures.

[2 marks]

$x =$ _____

- 8 The n th term of a sequence is $\frac{n^2 + 21}{n + 3}$
One term of the sequence is equal to 7.
Work out which term it is.
You must show your working.

[3 marks]

Answer _____

- 9 Solve $x(x + 4)^2 = 2x(x + 9)$
Give the non-zero solutions in the form $a \pm \sqrt{b}$, where a and b are integers.
Do not use trial and improvement.
You must show your working.

[4 marks]

Answer _____