
A34...Solving Quadratics by
Factorising.
No Co-efficients

OCR

(c) (i) Factorise.

$$x^2 - 2x - 15$$

(c)(i) [2]

(ii) Solve.

$$x^2 - 2x - 15 = 0$$

(ii) [1]

(c) (i) Factorise.
 $x^2 - 2x - 15$

$$(x - 5)(x + 3)$$

$$\begin{array}{rcl} & -15 & \\ -5 & +3 & = -2 \checkmark \\ +5 & -3 & = +2 \\ -15 & +1 & \\ +15 & -1 & \end{array}$$

(c)(i) $(x - 5)(x + 3)$ [2]

(ii) Solve.

$$x^2 - 2x - 15 = 0$$

$$(x - 5)(x + 3) = 0$$

$$\left. \begin{array}{l} x - 5 = 0 \\ x = 5 \end{array} \right\} \begin{array}{l} x + 3 = 0 \\ x = -3 \end{array}$$

(ii) $5 \text{ or } -3$ [1]

7 (a) Simplify.

$$7t - 6u + 5t - 4u$$

(a) [2]

(b) Factorise.

$$5v + 20w$$

(b) [1]

(c) Solve by factorising.

$$x^2 + 10x + 21 = 0$$

(c) $x =$ or $x =$ [3]

7 (a) Simplify.

$$7t - 6u + 5t - 4u$$

(a) $12t - 10u$ [2]

(b) Factorise.

$$5v + 20w$$

$$5(v + 4w)$$

(b) $5(v + 4w)$ [1]

(c) Solve by factorising.

$$\begin{array}{r} 21 \\ \swarrow \searrow \\ +7 \quad +3 \\ +21 \quad +1 \end{array}$$

$$\begin{array}{c} + - \quad \nearrow x \\ x^2 + 10x + 21 = 0 \\ (x + 7)(x + 3) = 0 \end{array}$$

	x	$+7$
x	x^2	$+7x$
$+3$	$+3x$	21

(c) $x = -7$ ✓ or $x = -3$ ✓ [3]

(b) Solve by factorising.

$$x^2 + 11x + 30 = 0$$

(b) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

(b) Solve by factorising.

A34 $x^2 + 11x + 30 = 0$

$$(x + 6)(x + 5) = 0$$

$$x = -6 \text{ or } x = -5$$

+30

+10

+3

+6

+5

+15

+2

(b) $x = \dots -6 \dots$ or $x = \dots -5 \dots$ [3]

(c) Solve by factorising.

A34

$$x^2 - 7x + 10 = 0$$

(c) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

(c) Solve by factorising.

$$x^2 - 7x + 10 = 0$$

A34

$$(x - 5)(x - 2) = 0$$

$$x - 5 = 0 \quad \text{or} \quad x - 2 = 0$$

$$x = 5$$

$$x = 2$$

(c) $x = 5$ or $x = 2$ [3]

$$\begin{array}{cc} & 10 \\ -5 & -2 \end{array}$$

27 Solve by factorising.

A34 $x^2 + 3x - 10 = 0$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

27 Solve by factorising.

A34

$$x^2 + 3x - 10 = 0$$

$$(x + 5)(x - 2) = 0$$

$$x = -5 \quad \left\{ \quad x = +2 \right.$$

$$\begin{array}{cc} & x \\ & -10 \\ -5 & +2 \\ +5 & -2 \\ & +3 \checkmark \end{array}$$

$$x = -5 \text{ or } x = +2 \quad [3]$$

18 Solve by factorising.

A34 $x^2 + 9x + 20 = 0$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

18 Solve by factorising.

A34 $x^2 + 9x + 20 = 0$

$$(x + 5)(x + 4) = 0$$

$$\boxed{0} \times \boxed{0} = 0$$

$$\begin{array}{cc} +20 & \\ +5 & +4 \end{array}$$

$$x = \overset{-5}{\dots\dots\dots} \text{ or } x = \overset{-4}{\dots\dots\dots} \quad [3]$$

(c) Solve by factorising.

A34 $x^2 + 15x + 56 = 0$

(c) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

(c) Solve by factorising.

A34 $x^2 + 15x + 56 = 0$

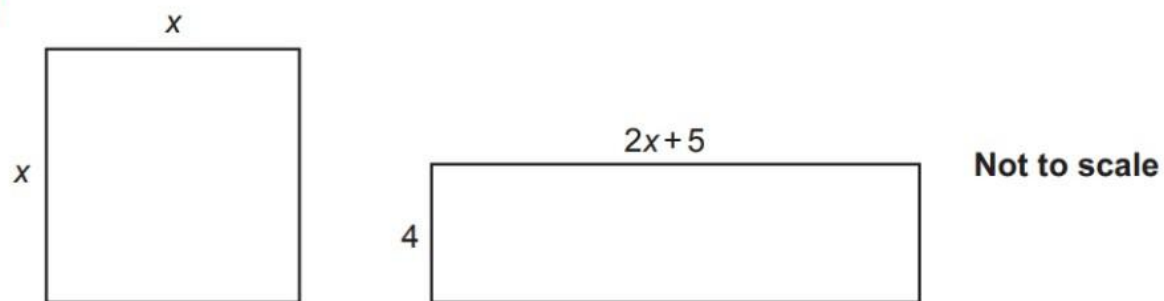
56
7 x 8

$$(x + 7)(x + 8) = 0$$

(c) $x = -7$ or $x = -8$ [3]

22 In this question, all measurements are in centimetres.

A34



The square and the rectangle have the same area.

(a) Show that $x^2 - 8x - 20 = 0$.

[3]

(b) Solve $x^2 - 8x - 20 = 0$.

(b) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

(c) Explain why one of the answers in part **(b)** is not possible in the context of the question.

.....

..... **[1]**

(d) Write down the following.

(i) The area of the square.

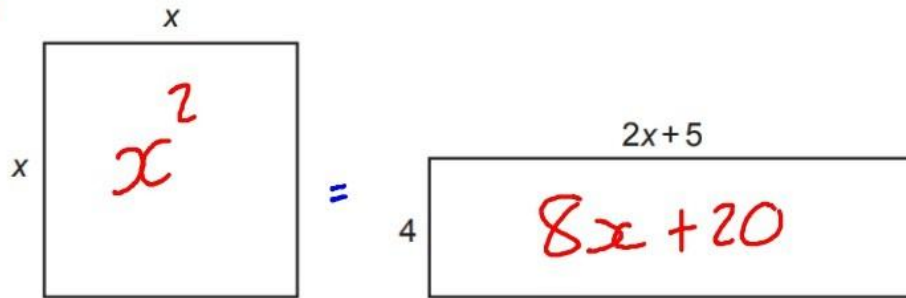
(d)(i) cm^2 **[1]**

(ii) The length of the rectangle.

(ii) cm **[1]**

22 In this question, all measurements are in centimetres.

A34



Not to scale

$$4(2x+5) = 8x+20$$

The square and the rectangle have the same area.

(a) Show that $x^2 - 8x - 20 = 0$.

[3]

$$x^2 = 8x + 20$$

$$x^2 - 8x - 20 = 0 \quad \checkmark$$

(b) Solve $x^2 - 8x - 20 = 0$.

$$(x - 10)(x + 2) = 0$$

$$x = 10$$

$$x = -2$$

	-20 ✓
-10	+2 ✓
+10	-2 ✓
+5	-4 ✓
-5	+4 ✓

(b) $x = 10$ or $x = -2$ [3]

(c) Explain why one of the answers in part (b) is not possible in the context of the question.

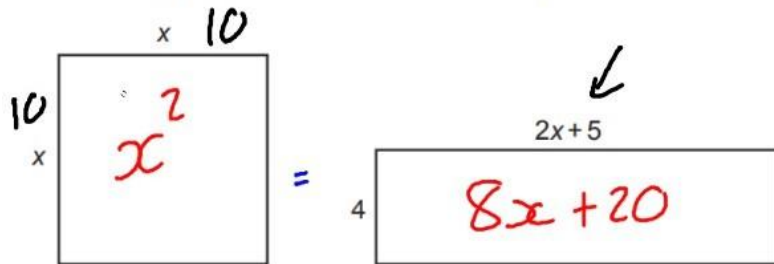
-2 is not possible.

Can't have a negative measurement [1]

(d) Write down the following.

$$x = 10$$

(i) The area of the square.



(d)(i) $10 \times 10 = 100 \text{ cm}^2$ [1]

(ii) The length of the rectangle.

$$2(10) + 5$$

(ii) 25 cm [1]

Edexcel

24 Solve $x^2 + 5x - 24 = 0$

(Total for Question 24 is 3 marks)

24 Solve $x^2 + 5x - 24 = 0$

$$(x - 3)(x + 8) = 0$$

$$\begin{array}{ccc} ? & \times & ? = 0 \\ \text{must be} & & \text{must be} \\ 0 & & 0 \end{array}$$

$$x = 3 \quad \text{and} \quad x = -8$$

$$\begin{array}{ccc} & \times & \\ & -24 & \\ \swarrow & & \searrow \\ -3 & +8 & = +5 \checkmark \\ +3 & -8 & = -5 \\ -12 & +2 & = -10 \\ +12 & -2 & \\ -6 & +4 & \\ +6 & -4 & \end{array}$$

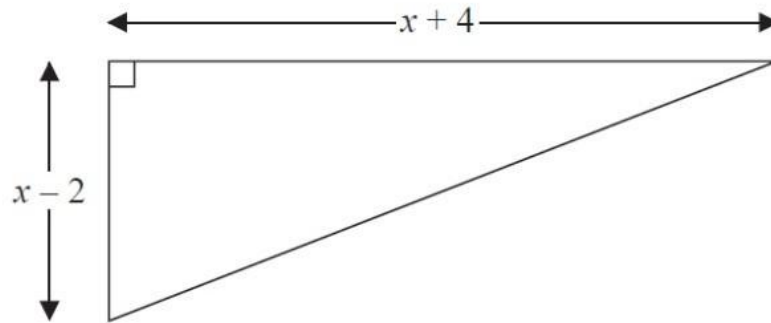
$$x = 3, \quad x = -8$$

(Total for Question 24 is 3 marks)

14 The diagram shows a right-angled triangle.

A31

A34



All the measurements are in centimetres.

The area of the triangle is 27.5 cm^2

Work out the length of the shortest side of the triangle.

You must show all your working.

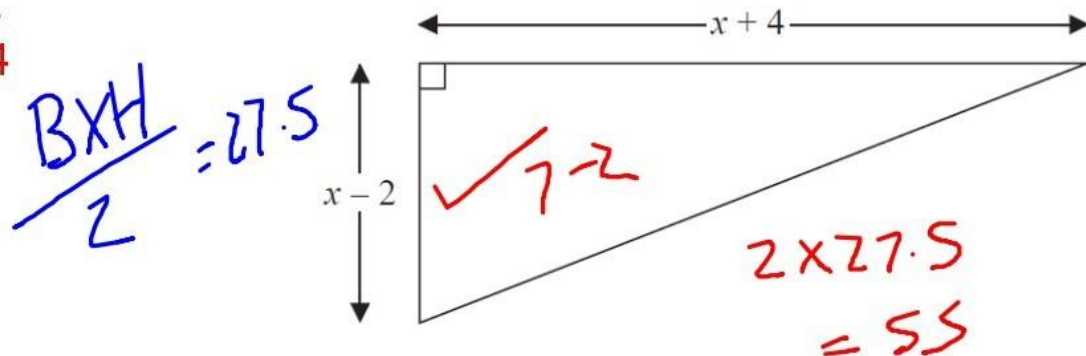
..... cm

(Total for Question 14 is 4 marks)

14 The diagram shows a right-angled triangle.

A31

A34



All the measurements are in centimetres.

The area of the triangle is 27.5 cm^2

Work out the length of the shortest side of the triangle.
You must show all your working.

$$\frac{(x+4)(x-2)}{2} = 27.5$$

$$\frac{x^2 - 2x + 4x - 8}{2} = 27.5$$

$$= x^2 + 2x - 8 = 55$$

$$= x^2 + 2x - 8 - 55 = 0$$

$$= x^2 + 2x - 63 = 0$$

$$= (x+9)(x-7) = 0$$

$$x = -9 \quad x = 7$$

$$7-2$$

$$5 \text{ cm}$$

(Total for Question 14 is 4 marks)

27 Solve $x^2 - 7x - 18 = 0$

A34

.....
(Total for Question 27 is 3 marks)

27 Solve $x^2 - 7x - 18 = 0$

A34

$$(x - 9)(x + 2) = 0$$

$$x = 9 \text{ and } x = -2$$

.....
(Total for Question 27 is 3 marks)

8 Solve $x^2 = 5x + 24$

A34

(Total for Question 8 is 3 marks)

8 Solve $x^2 = 5x + 24$

A34

$$x^2 = 5x + 24$$

$$x^2 - 5x - 24 = 0$$

$$(x - 8)(x + 3) = 0$$

$$x = 8 \text{ and } x = -3$$

(Total for Question 8 is 3 marks)

AQA

31

Solve $x^2 - x - 12 = 0$

[3 marks]

A34

Answer

31

Solve $x^2 - 1x - 12 = 0$

[3 marks]

A34

$$(x + 3)(x - 4) = 0$$

-12

-3

$$+4 = 1x$$

+3

$$-4 = -1x$$

Answer

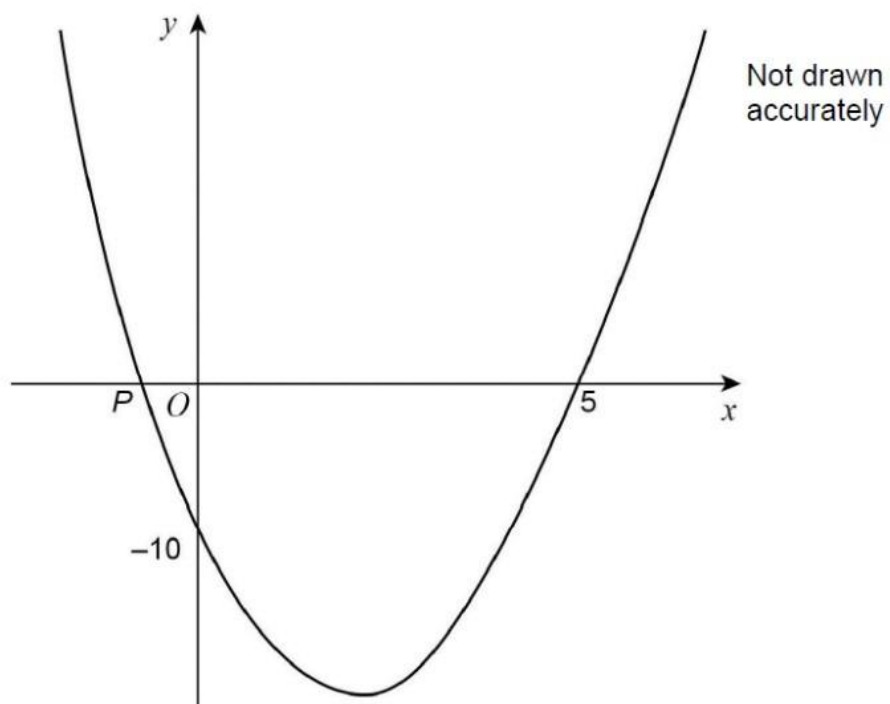
$$x = -3 \text{ and } x = 4$$

23 Here is a sketch of $y = x^2 + bx + c$

A34 The curve intersects
the x -axis at $(5, 0)$ and point P
the y -axis at $(0, -10)$

Work out the x -coordinate of the turning point of the graph.

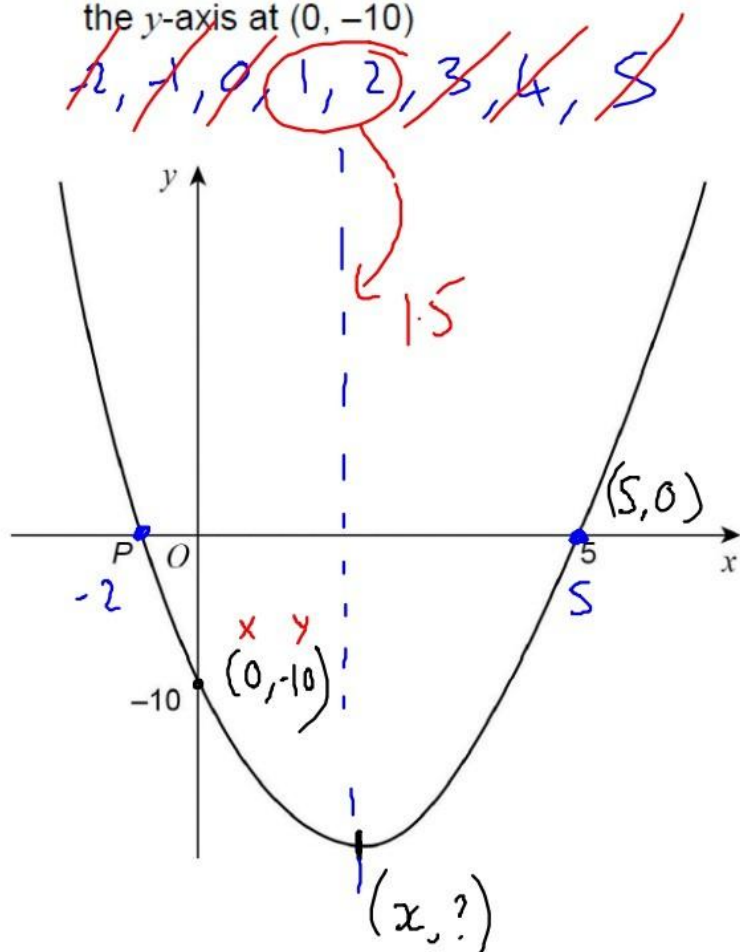
[4 marks]



Answer _____

23 Here is a sketch of $y = x^2 + bx + c$

A34 The curve intersects
the x -axis at $(5, 0)$ and point P
the y -axis at $(0, -10)$



Work out the x -coordinate of the turning point of the graph.

[4 marks]

$$\begin{aligned} (x, y) & \quad y = x^2 + bx + c \\ (0, -10) & \quad -10 = 0^2 + b(0) + c \\ & \quad -10 = c \end{aligned}$$

Not drawn
accurately

$$(x, y) \\ (5, 0)$$

$$y = x^2 + bx - 10$$

$$0 = 25 + 5b - 10$$

$$0 = 15 + 5b$$

$$-15 = 5b$$

$$\frac{-15}{5} = b \quad \dots \quad b = -3 \checkmark$$

$$x^2 - 3x - 10 = 0$$

$$(x - 5)(x + 2) = 0$$

$$x = 5 \quad x = -2$$

Answer

$$x = 1\frac{1}{2} \checkmark$$

18

Circle the **two** roots of $(2x + 3)(5x - 2) = 0$

[1 mark]

A34

$$-\frac{3}{2}$$

$$-\frac{2}{5}$$

$$\frac{2}{5}$$

$$\frac{3}{2}$$

18

Circle the **two** roots of $(2x + 3)(5x - 2) = 0$

[1 mark]

A34

$$\frac{3}{2}$$

$$-\frac{2}{5}$$

$$\frac{2}{5}$$

$$\frac{3}{2}$$

$$2x + 3 = 0$$

$$2x = -3$$

$$x = -\frac{3}{2} \checkmark$$

$$5x - 2 = 0$$

$$5x = 2$$

$$x = \frac{2}{5}$$

4

Circle the **two** roots of $(x - 5)(x + 3) = 0$

[1 mark]

A34

-5

-3

3

5

4

Circle the **two** roots of $(x - 5)(x + 3) = 0$

[1 mark]

A34

-5

-3

3

5

$$x - 5 = 0$$

$$x = 5$$

$$x + 3 = 0$$

$$x = -3$$

22

A34

The **only** solution to $x^2 + bx + c = 0$ is $x = 5$

Work out the values of b and c .

[2 marks]

$b =$ _____ $c =$ _____

22

A34

The **only** solution to $x^2 + bx + c = 0$ is $x = 5$ ✓

Work out the values of b and c .

[2 marks]

$$(x-5)(x-5) = 0$$

$$(x-5)(x-5)$$

$$x^2 - 5x - 5x + 25$$

$$x^2 - 10x + 25 = 0$$

$$b = -10 \quad c = 25$$