
A32...Factorising Quadratics...

No Co-efficient

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 or -3 [1]

(ii) $x^2 + 8x + 12$

(ii) [2]

(ii) $x^2 + 8x + 12$

Handwritten annotations: A red circle around $+8x$ with a red line pointing to a red $+/-$ above it. A red circle around $+12$ with a red line pointing to a red x above it.

$(x \quad x)$

Handwritten factorization tree for 12:

```

      12
     /  \
  +4    +3
  /  \  /  \
+6  +2 +6  +2
+12 +1
  
```

$= 8$

(ii) $(x+6)(x+2)$ [2]

13 (a) Solve.

A32

$$x^2 - 6x + 15 = 3x - 5$$

(a) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [4]

13 (a) Solve.

A32

$$x^2 - 6x + 15 = 3x - 5$$

$$x^2 - 6x - 3x + 15 + 5 = 0$$

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

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

$$x = 5 \quad x = 4$$

(a) $x = 5$ or $x = 4$ [4]

Edexcel

23

Maryam is trying to expand and simplify $(n - 2)^2$
Here is her working.

$$\begin{aligned}(n - 2)^2 &= (n - 2)(n - 2) \\ &= n^2 - 2n - 2n - 4 \\ &= n^2 - 4n - 4\end{aligned}$$

Maryam's answer is wrong.

(a) Find Maryam's mistake.

(1)

Josh is trying to factorise $x^2 - 6x + 8$
His reasoning is,

because $4 \times 2 = 8$
and $4 + 2 = 6$

then $x^2 - 6x + 8 = (x + 4)(x + 2)$

(b) Explain what is wrong with Josh's reasoning.

(1)

Maryam is trying to expand and simplify $(n-2)^2$
Here is her working.

$$\begin{aligned}(n-2)^2 &= (n-2)(n-2) \\ &= n^2 - 2n - 2n - 4 \\ &= n^2 - 4n - 4\end{aligned}$$

$$\begin{aligned}-2 \times -2 \\ = +4\end{aligned}$$

Maryam's answer is wrong.

(a) Find Maryam's mistake.

$$-2 \times -2 = +4$$

$$\text{not } -4 \checkmark$$

(1)

Josh is trying to factorise $x^2 - 6x + 8$
His reasoning is,

$$\text{because } 4 \times 2 = 8 \checkmark$$

$$\text{and } 4 + 2 = \underline{6}$$

$$\text{then } x^2 - 6x + 8 = (x+4)(x+2)$$

$$\begin{aligned}x^2 - 6x + 8 \\ (x-4)(x-2)\end{aligned}$$

(b) Explain what is wrong with Josh's reasoning.

The two factors need to add to -6 not $+6$
factors used should be -4 and $-2 \checkmark$

(1)

(c) Factorise $x^2 + 6x + 9$

.....
(1)

(Total for Question 24 is 5 marks)

(c) Factorise $x^2 + 6x + 9$

$$(x+3)(x+3), \text{ or } (x+3)^2$$

(1)

(Total for Question 24 is 5 marks)



(b) Factorise $x^2 + 4x + 3$

A32

(2)

(b) Factorise $x^2 + 4x + 3$

A32

$$(x+3)(x+1)$$

$$(x+1)(x+3)$$

3

$$+3 \quad +1 \quad = +4$$

(b) Factorise $x^2 - 2x - 35$

A32

.....
(2)

(b) Factorise $x^2 \overset{+/-}{\boxed{-2}} x \overset{x}{\boxed{-35}}$

A32

$$(x - 7)(x + 5)$$

$$\frac{(x-7)(x+5)}{(2)}$$

-35

-7 +5

+7 -5

18 Write $\frac{3(x-1)}{x^2-4x-5} - \frac{2}{x-5}$ as a single fraction in its simplest form.

A32

A51

.....

(Total for Question 18 is 4 marks)

18 Write $\frac{3(x-1)}{x^2-4x-5} - \frac{2}{x-5}$ as a single fraction in its simplest form.

A32

A51

$$\frac{3x-3}{(x-5)(x+1)} - \frac{2(x+1)}{(x-5)(x+1)}$$

$$\frac{x^2-4x-5}{(x-5)(x+1)}$$

$$= \frac{(3x-3) - (2x+2)}{(x-5)(x+1)}$$

$$= \frac{\cancel{x-5}}{(\cancel{x-5})(x+1)}$$

$$= \frac{1}{x+1}$$

(Total for Question 18 is 4 marks)

AQA

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Circle the expression equivalent to $x^2 - 4x - 12$

[1 mark]

A32

$(x - 4)(x - 8)$

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

$(x - 12)(x + 1)$

$(x + 2)(x - 6)$

A32

Circle the expression equivalent to

$$x^2 - 4x - 12$$

[1 mark]

$$(x - 4)(x - 8)$$

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

$$(x - 12)(x + 1)$$

$$(x + 2)(x - 6)$$

$$x^2 - 4x - 12$$
$$(x - 6)(x + 2)$$

$$\begin{array}{rcl}
 -12 & +1 & = -11 \\
 +12 & -1 & 11 \\
 +4 & -3 & 1 \\
 -4 & +3 & -1 \\
 +6 & -2 & 4 \\
 -6 & +2 & -4
 \end{array}$$

16 (b) Factorise $3x^2 - 22x + 7$

[2 marks]

A32

A44

Answer

16 (b)

Factorise $3x^2 - 22x + 7$

A32

A44

[2 marks]

$-7 \quad -1$

$$(3x - 1)(x - 7)$$

Answer $(3x - 1)(x - 7)$

$$\begin{aligned} & -1x - 21x \\ & = -22x \checkmark \end{aligned}$$

32

Factorise

$x^2 + 7x + 10$

[2 marks]

A32

Answer

32

Factorise

$x^2 + 7x + 10$

[2 marks]

A32

$$(x+5)(x+2)$$



Answer
