

Mark schemes

Q1.

(a) $(x + a)(x + b)$
where $ab = \pm 24$

M1

$(x + 8)(x - 3)$
either order

A1

(b) $(x =) - 8$ and $(x =) 3$
ft their part (a)

B1 ft

[3]

Q2.

(a) $x + 7.5$ or $7.5 + x$
 $x + 7\frac{1}{2}$

B1

(b) $x(x + 7.5) = 2(x + x + 7.5)$
ft their $x + 7.5$ from (a) in the form $x + c$ for all 4 method marks

M1

$x^2 + 7.5x = 4x + 15$

M1

$x^2 + 3.5x - 15 = 0$

or

$2x^2 + 7x - 30 = 0$

M1

$(2x - 5)(x + 6) (= 0)$

M1

2.5 and 10

either order but in correct pairs

and

-6 and 1.5

SC1 one correct pair

A1

[6]

Q3.

$$(x^2 + 2x - 3) - (x^2 + x - 3)$$

Or attempt to 'balance' equations

M1

$$y = x$$

A1

- 2.3 and 1.3

ft if M awarded and their line drawn

A1ft

[3]

Q4.

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

Substitutes any value for x into both expressions but not $x = 0$

M1

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

Sets up a correct equation in b

M1dep

$$(b =) 2 \text{ or } x^2 + 2x - 15$$

A1

[3]

Q5.

$$(x + 4)(x - 5) (= 90)$$

M1

$$x^2 + 4x - 5x - 20 (= 90)$$

Allow 1 error

M1

$$x^2 - x - 110 (= 0)$$

Collecting their 4 terms and 90 dependent on 2nd M1 only

M1dep

$$(x + 10)(x - 11)$$

$(x + a)(x + b)$ where $ab = \pm$ their 110
Use of formula – allow one error

M1

11

Note: 11 and - 10 implies M4A0

A1

[5]

Q6.

$$(a) \quad x^2 - 4x + 5x - 20$$

Allow one error

M1

$$x^2 + x - 20$$

A1

(b) 8 and -7

B1

[3]

Q7.

(a) $(x - 4)(x - 5)$

B1 for $(x - a)(x - b)$ where $ab = 20$

or $a + b = -9$

B2

(b) 4 and 5

ft their part (a) provided two brackets

B1ft

[3]

Q8.

$$(x + 2)(6x - 1) = 28$$

M1

$$6x^2 - x + 12x - 2 = 28$$

Allow one error

M1dep

$$6x^2 + 11x - 30 (= 0)$$

Collect terms to one side, ft their four terms

M1dep

$$(3x + 10)(2x - 3) (= 0)$$

A1

$$(x = -\frac{10}{3} \text{ and } x = 1.5$$

oe

ft their two brackets

B1ft

$$2(6 \times 1.5 - 1 + 1.5 + 2)$$

$$\text{or } 14 \times 1.5 + 2$$

$$2(6x - 1 + x + 2)$$

$$\text{or } 14x + 2$$

M1

23

(and $x = -\frac{10}{3}$ discarded)

May be implied

B1ft

[7]

Q9.

(a) $30x^3y^7$

B1 for two correct terms

B2

Additional Guidance

Do not ignore fw for B2

$30 \times x^3 \times y^7$

B1

$30 \times x^3y^7$

B1

x^3y^730

B1

$7x^3 \times 4y^7$

B1

Do not allow addition sign,

eg $10x^3 + 3y^7$

B0

(b) $x^2 - 3x + 7x - 21$

Allow one error

M1

$x^2 + 4x - 21$

A1

Additional Guidance

Do not ignore fw unless attempting to solve the equation

$x^2 - 3x - 21$ or $x^2 + 7x - 21$ (one error)

M1A0

$x^2 - 21$ (two errors)

M0A0

$x^2 - 4x - 21$ with no other working (two errors)

M0A0

(c) 8 and -2

or $x = 8$ and $x = -2$

Any order

B1

(d) $2xy(4x + 3y)$

B1 for a correct partial factorisation

$x(8xy + 6y^2)$

$y(8x^2 + 6xy)$

$2(4x^2y + 3xy^2)$

$2x(4xy + 3y^2)$

$2y(4x^2 + 3xy)$

$xy(8x + 6y)$

B2

[7]