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

$x2 + 3.5x - 15 = 0$

or

$2x2 + 7x - 30 = 0$

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

$(b =) 2$ 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 = ± their 110
Use of formula – allow one error

M1

11

Note: 11 and −10 implies M4A0

A1

[5]

Q6.

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

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

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

oe

ft their two brackets

B1ft

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

or $14 \times 1.5 + 2$

2(6x − 1x + 2) + or 14x + 2

M1

23

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

May be implied

B1ft

[7]

Q9.

(a) $30x3y7$

B1 for two correct terms

B2

Additional Guidance

Do not ignore fw for B2

$30 \times x3 \times y7$

B1

$30 \times x3y7$

B1

$x3y30$

B1

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

B1

Do not allow addition sign,

eg $10x3 + 3y7$

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

$x2 - 3x - 21$ or $x2 + 7x - 21$ (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 + 6y2)

y (8x2 + 6xy)

2 (4x2y + 3xy2)

2x(4xy + 3y2)

2y(4x2 + 3xy)

x(8xy + 6y)

B2

[7]