Q1-2

1

Find two numbers that multiply to give -10 and add to give 3

5 and -2

Write these numbers in the brackets $(x \pm ...)(x \pm ...)$

allowing sign errors [1]
$(x + 5)(x - 2)$ [1]

2

Find two numbers that multiply to give 16 and add to give -10

-2 and -8

Write these numbers in the brackets $(y \pm ...)(y \pm ...)$

allowing sign errors [1]
$(y - 2)(y - 8)$ [1]

Q3

3a

i) Find two numbers that multiply to give 27 and add to give -12

-3 and -9

Write these numbers in the brackets $(x \pm ...)(x \pm ...)$

allowing sign errors [1]
$(x - 3)(x - 9)$ [1]

ii) Solve the first bracket equal to zero (by adding 3 to both sides)

$x - 3 = 0$
$x = 3$

Solve the second bracket equal to zero (by adding 9 to both sides)

$x - 9 = 0$
$x = 9$

Write down both solutions together

x = 3 or x = 9 [1]

3b

The "difference of two squares" says that $a^2 - b^2$ factorises to $(a + b)(a - b)$
Write both terms as squares

$y^2 - 10^2$

Use the "difference of two squares" to factorise

$(y + 10)(y - 10)$ [1]

Q4-5

4

Find two numbers that multiply to give 6 and add to give 7

1 and 6

Write these numbers in the brackets $(y \pm ...)(y \pm ...)$

allowing sign errors [1]

$(y + 1)(y + 6)$ [1]

5

Find two numbers that multiply to give -4 and add to give 3

4 and -1

Write these numbers in the brackets $(x \pm ...)(x \pm ...)$

allowing sign errors [1]

$(x + 4)(x - 1)$ [1]

Q6

6

The "difference of two squares" says that $a^2 - b^2$ factorises to $(a + b)(a - b)$
Write both terms as squares

$x^2 - 7^2$

Use the "difference of two squares" to factorise

$(x + 7)(x - 7)$ [1]

Q7

7a

Find the largest factor that divides both terms (with no remainder)

$4a$ divides $8a^2$ and $12a$

See how each term is multiplied by this factor

$4a \times 2a$ and $4a \times 3$

Write the factor outside brackets that expand to give $8a^2 + 12a$

'a' factorised correctly [1]

$4a(2a + 3)$ [1]

7b

Find two numbers that multiply to give -2 and add to give -1

1 and -2

Write these numbers in the brackets $(y \pm ...)(y \pm ...)$

allowing sign errors [1]

$(y + 1)(y - 2)$ [1]

Q8-9

8

Find two numbers that multiply to give -12 and add to give 1

4 and -3

Write these numbers in the brackets $(e \pm ...)(e \pm ...)$

allowing sign errors [1]

$(e + 4)(e - 3)$ [1]

9

Find the largest factor that divides both terms (with no remainder)

$3xy$ divides $3xy^2$ and $-6xy$

See how each term is multiplied by this factor

$3xy \times y$ - $3xy \times 2$

Write the factor outside brackets that expand to give $3xy^2 - 6xy$

x or y correctly factorised [1]

$3xy(y - 2)$ [1]

Q10

10a

Find the largest factor that divides both terms (with no remainder)

3 divides $6m$ and -9

See how each term is multiplied by this factor

$3 \times 2m$ - 3×3

Write the factor outside brackets that expand to give $6m - 9$

$3(2m - 3)$ [1]

10b

Find the largest factor that divides both terms (with no remainder)

$2xy$ divides $2x^2y$ and $4xy^2$

See how each term is multiplied by this factor

$2xy \times x$ + $2xy \times 2y$

Write the factor outside brackets that expand to give $2x^2y + 4xy^2$

x or y correctly factorised [1]

$2xy(x + 2y)$ [1]

Q11

11a

Add the powers of n in the numerator (using the index law $a^m \times a^n = a^{m+n}$)

$$n^{7+3} = n^{10}$$

[1]

Subtract the powers of n (using the index law $\frac{a^m}{a^n} = a^{m-n}$)

$$\frac{n^{10}}{n^6} = n^{10-6}$$

n^4 [1]

11b

Multiply the terms outside the brackets by all the terms inside the brackets

$$x \times x - x \times 2 + 2x \times x + 2x \times 3$$

Simplify the terms (by multiplying their parts together and using $x \times x = x^2$)

$$x^2 - 2x + 2x^2 + 6x$$

first or second pair of terms correct [1]

$$x^2 - 2x + 2x^2 + 6x$$

first or second pair of terms correct [1]

Collect the x terms

$$-2x + 6x = 4x$$

Collect the x^2 terms

$$x^2 + 2x^2 = 3x^2$$

Write down the final answer

$3x^2 + 4x$ [1]

11c

Find the largest factor that divides both terms (with no remainder)

5 divides $5y$ and -15

See how each term is multiplied by this factor

$$5 \times y \text{ - } 5 \times 3$$

Write the factor outside brackets that expand to give $5y$ - 15

Write the factor outside brackets that expand to give $5y - 15$

$5(y - 3)$ [1]

11d

Find the largest factor that divides both terms (with no remainder)

$9ab$ divides $18ab$ and $27ab^2$

See how each term is multiplied by this factor

$9ab \times 2 + 9ab \times 3b$

Write the factor outside brackets that expand to give $18ab + 27ab^2$

a or b correctly factorised [1]

$9ab(2 + 3b)$ [1]

Q12-13

Find the largest factor that divides both terms (with no remainder)

$4x$ divides $8x^2$ and $4xy$

See how each term is multiplied by this factor

$4x \times 2x + 4x \times y$

Write the factor outside brackets that expand to give $8x^2 + 4xy$

x correctly factorised [1]

$4x(2x + y)$ [1]

13

Find the largest factor that divides both terms (with no remainder)

$3y$ divides $6y^2$ and $-9xy$

See how each term is multiplied by this factor

$3y \times 2y - 3y \times 3x$

Write the factor outside brackets that expand to give $6y^2 - 9xy$

y correctly factorised [1]

$3y(2y - 3x)$ [1]

Q14-15

14

Find the largest factor that divides both terms (with no remainder)

$3x$ divides $9x^2$ and $-6xy$

See how each term is multiplied by this factor

$3x \times 3x - 3x \times 2y$

Write the factor outside brackets that expand to give $9x^2 - 6xy$

x correctly factorised [1]

$3x(3x - 2y)$ [1]

15

Find two numbers that multiply to give -35 and add to give -2.

-7 and 5

Write these numbers in the brackets $(y \pm ...)(y \pm ...)$.

$(y - 7)(y + 5)$
For ±7 and ±5 [1]
Fully correct [1]

Q16-17

16

Find two numbers that multiply to give 24 and add to give -11.

-8 and -3

Write these numbers in the brackets $(x \pm ...)(x \pm ...)$.

$(x - 8)(x - 3)$
For ±8 and ±3 [1]
Fully correct [1]

17

Write x^2 and $-5x$ as multiplications of their factors

$x \times x - 5 \times x$

Factorise the expression (by taking out the common factor of x)

$x(x - 5)$

This shows that both x and $x - 5$ are factors of the whole expression $x^2 - 5x$

$x - 5$ [1]

Q18

18

Method 1

Factorise using the difference of two squares, which states that $a^2 - b^2 = (a + b)(a - b)$

$$x^2 - 8^2 = (x + 8)(x - 8)$$

$(x + 8)(x - 8)$ [1]

Method 2

Expand each of the answers given to see which one is the same as $x^2 - 64$

$$(x + 8)^2 = (x + 8)(x + 8) = x^2 + 16x + 64$$

$$(x - 8)^2 = (x - 8)(x - 8) = x^2 - 16x + 64$$

$$(x + 8)(x - 8) = x^2 + 8x - 8x - 64 = x^2 - 64$$

$$x(x - 64) = x^2 - 64x$$

$(x + 8)(x - 8)$ [1]