M1.

(a) x^2 (+) $9x$ (+) $5x$ (+) 45

Allow one error

Any order

M1

x^2 + $14x$ + 45

Any order

A1

Additional Guidance

Terms may be seen in a multiplication grid

Do not ignore attempts to factorise after correct answer seen $x(x + 14) + 45$

M1A0

$x^2 + 14x + 40$ with no working seen is one error

M1A0

$x^2 + 10x + 45$ with no working seen is two errors

M0A0

$x^2 + 5x + 45$ with no working seen

M0A0

(b) $5x(x - 2y)$

B1 $5(x^2 - 2xy)$ *or* $x(5x - 10y)$

B2

Additional Guidance

Condone missing final bracket $5x(x - 2y$

B2

$5x \times (x - 2y)$

B1

Condone missing final bracket $5(x^2 - 2xy$

B1

[4]

M2.

(a) $2x^2 - 6x + x - 3$

Must be 4 terms
Allow one error
May be in a grid

M1

$2x^2 - 5x - 3$

Do not ignore fw

A1

Additional Guidance

$2x^2 - 5x + 3$

M1A0

$2x^2 - 5x + - 3$

M1A0

$2x^2 - 4x - 3$

M0A0

For method mark the four terms may be e.g. in a grid with correct negative signs

(b) $(y - 4)(y + 6)$

B1 for $(y + a)(y + b)$ *such that*
$ab = -24$ *or* $a + b = 2$
or B1 for
$y(y + 6) - 4(y + 6)$
or $y(y - 4) + 6(y - 4)$

B2

Additional Guidance

$(y + 4)(y - 6)$

B1

$(y - 12)(y + 2)$

B1

$(y + 13)(y - 11)$

B1

$y(y + 6)$

B0

Condone use of x or another letter

(c) $32x^5\ y^{15}$

B1 for two terms correct in a product

B2

Additional Guidance
Penalise multiplication signs for B2
+ sign(s) in answer scores B0
Mark final answer

$32 \times x^5 \times y^{15}$

B1

$32 \times 5x^5 \times y^{15}$

B1

$32x^5\ y^8$

B1

$32xy^{15}$

B1

$32 + x^5 + y^{15}$

B0

[6]

M3. $a = 3$

B1

$(2x + 1)(ax + b) = 2ax^2 + ax + 2bx + b$

or

$(2x + 1)(3x + b) = 6x^2 + 3x + 2bx + b$

M1

$3x + 2bx = -5x$ or $3 + 2b = -5$

or $3x - 8x = -5x$

M1dep

$b = -4$ and $c = -4$

A1

[4]

M4. $8x^2 - 12xy - 10xy + 15y^2$

Allow one term error

M1

$8x^2 - 12xy - 10xy + 15y^2$

A1

$8x^2 - 22xy + 15y^2$

ft their four terms if M1 awarded
Do not ignore fw for final mark

A1 ft

[3]

M5. (a) $6x^2 + 4x + 15x + 10$

Allow one sign or arithmetic error. Must see 4 terms including term in x^2, 2 terms in x and a constant term

M1

$6x^2 + 19x + 10$

***NB** Answer only*
$6x^2 + 19x + b$ implies M1
$ax^2 + 19x + 10$ implies M1
Do not award if incorrect further work

A1

(b) $9x^4y^8$

B1 for two of 9, x^4 or y^8
B1 maximum for any use of × signs
B0 for any addition eg $9 + x^4 + y^8$

Deduct one mark for incorrect further work

B2

[4]

M6.

$6x^2$ (+) $3x$ (+) $8x$ (+) 4

4 terms, including one in x^2, with at least 3 correct

M1

$6x^2 + 3x + 8x + 4$

A1

$6x^2 + 11x + 4$

ft correct simplification of their four terms, including one in x^2

SC1 $6x^2 + ax + 4$, $a \neq 0$, M1 not awarded

A1ft

[3]

M7.(a) $x^2 - 5x - 6x + 30$

four terms, three correct with a term in x^2 or $x^2 - 11x + k$ with $k \neq 0$

M1

$x^2 - 11x + 30$

A1

(b) $8a^7b^9$

B1 two correct from 8, a^7 and b^9

B1 correct answer with multiplication sign(s)

B2

[4]

M8. $c^2 = 16$ or $c = 4$ or $c = -4$

M1

$3x^2 + 3cx + cx + c^2$ (= $3x^2 - dx + 16$)

$3x^2 + 12x + 4x + 16$ or $3x^2 - 12x - 4x + 16$ oe

M1

$c = 4$ **and** $c = -4$ or $4c = -d$ or $16 = -d$ or $-16 = -d$

oe

M1

$c = 4$ and $d = -16$ **or** $c = -4$ and $d = 16$

One pair of answers or all four answers seen but not paired

A1

$c = 4$ and $d = -16$ **and** $c = -4$ and $d = 16$

Both pairs of answers must be correctly paired

*SC3 for one correct pair or both correct pairs or all four answers seen but not paired from **no** working*

A1

[5]

M9. $6x^2 - 15xy + 2xy - 5y^2$

3 terms correct

M1

$6x^2 - 15xy + 2xy - 5y^2$

A1

$6x^2 - 13xy - 5y^2$

ft from four terms

A1 ft

[3]

M10.(a) $2x^2 + x - 4x - 2$

4 terms, allow one error but must have a term in x^2

M1

$2x^2 + x - 4x - 2$

A1

$2x^2 - 3x - 2$ *oe*

ft their 4 terms if M1 awarded
SC1 answer of
$2x^2 - 5x - 2$ or $2x^2 + 3x - 2$ or
$2x^2 - 3x + 2$
without working worth at least M1

A1 fit

(b) $3(x^2 - 16y^2)$

M1

$(3)(x + ay)(x + by)$

where $ab = -16$

M1

$3(x - 4y)(x + 4y)$ *oe*

A1

Alternative method

$(3x + ay)(x + by)$

where $ab = -48$

M1

$(3x + 12y)(x - 4y)$

or

$(3x - 12y)(x + 4y)$

M1

$3(x - 4y)(x + 4y)$ *oe*

A1

[6]

M11. $(x + 4)(x - 5)$ (= 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]

M12.(a) $x^2 + 6x + 6x + 36$

Allow one error

M1

$x^2 + 12x + 36$

Do not ignore further working

A1

(b) $27wx - 36wy$ or $-5wx - 5wy$

M1

$27wx - 36wy - 5wx - 5wy$

A1

$22wx - 41wy$ or $w(22x - 41y)$

ft only if 3 of the 4 terms are correct

Do not ignore further working

A1ft

Correct symbolic notation for their simplified answer

Strand (i)

Must contain terms in wx and wy only

Q1

[6]