

Question 1

a) $20x^2 + 40$

b) $14a - 35$

c) $16k - 24k^2$

d) $24b^2 - 36b + 108$

e) $45m^2 - 63m + 27$

f) $24p^2 - 15p + 21$

Question 2

a) $3x + 19$

b) $24 - 5a$

c) $10 - 2y$

d) $28m - 33$

e) $-13p^2 - 12p$

f) $-8x - 21y$

Question 3

a) $60x^2 - 48x$

b) $6a - 21a^2$

c) $12p^2 - 6pq$

d) $135n^3 - 90n^2$

e) $21m^4n + 42m^3$

f) $-56x^2y - 40x^3$

Question 4

a) $2a^3b^2 - 2a^2b^3 - 2ab^3$

b) $3x^3y^3 + 3x^3y^2 - 3x^2y^2$

c) $5m^2n^3 - 5m^3n^3 - 15m^3n^2$

d) $5x^2 - y^2 - 7xy + 2y$

e) $2b^3 - 2b^2c - 2c^2 + 5bc$

f) $7x^3 - 7xy^2 - 2xy - 2x^2y - 2y^3$

Question 5

a) $8x^2 + 14xy + 3$

b) $30m^2 - 7m - 2$

c) $8c^2 - 22c + 15$

d) $9x^2 - 49$

e) $16t^2 - 12t - 40$

f) $24x^2 - 62x + 14$

Question 6

a) $g^2 + 2gh + h^2$

b) $x^2 + 2xy + y^2$

c) $m^2 + 2mn + n^2$

d) $b^2 + 2bc + c^2$

e) $p^2 - 2pq + q^2$

f) $k^2 - 2kl + l^2$

g) $s^2 - 2st + t^2$

h) $u^2 - 2uv + v^2$

Question 7

- a) $9x^2 + 6xy + y^2$ b) $x^2 + 10xy + 25y^2$ c) $9a^2 + 12a + 4$
d) $25x^2 - 90x + 81$ e) $16m^2 - 56m + 49$ f) $16y^2 + 88y + 121$
g) $25t^2 - 100t + 100$ h) $25 + 60b + 36b^2$

Question 8

- a) $6x^2 + 5xy + y^2$ b) $15a^2 + 2ab - b^2$ c) $6x^2 + 5xy - 4y^2$
d) $x^2 + 7xy + 12y^2$ e) $35m^2 - 19mn + 2n^2$ f) $18x^2 - 48xy + 14y^2$

Question 9

- a) $9a^2 + 30ab + 25b^2$ b) $4m^2 - 28mn + 49n^2$ c) $36s^2 - 24st + 4t^2$
d) $16p^2 - 24pq + 9q^2$ e) $64x^2 - 48xy + 9y^2$ f) $9s^2 + 30st + 25t^2$
g) $25f^2 - 40fg + 16g^2$ h) $25y^4 + 70y^2z^2 + 49z^2$

Question 10

- a) $x^2 - y^2$ b) $4m^2 - 25n^2$ c) $81a^2 - 16b^2$
d) $36x^2 - 4y^2$ e) $49p^2 - 4q^2$ f) $144m^2 - 81$

Question 11

- a) $3x^2 - 8x - 1$ b) $21x^2 - 18x$ c) $12m^2 - 26m + 36$
d) $6cd$ e) $-18a^2 - 51ab + 2b^2$ f) $9x^2 - 26xy + 7y^2$

Question 12

- a) $7x^2 - 11x - 1$ b) $-3s^2 + 13st - 11t^2$ c) $3x^2 + 4xy - 5y^2$
d) $5m^2 + 117mn - 131n^2$ e) $-40xy$ f) $-7x^4 - 19x^2 - 19$

Question 13

- a) $3x(x+2)$ b) $4y^2(2y-1)$ c) $5p^2(p-3)$
d) $8mn(3m+2n)$ e) $6a^2b^2(2+3a)$ f) $-7x^2y^2(4y+5x)$

Question 14

- a) $w(3w-7w^2+4)$ b) $-2x(x^4-2x+3-x^2)$ c) $4(2x^2-3x^4+4)$
d) $5ab(b+2-3a)$ e) $3xy(17x+13y-24)$ f) $3m^2n^2(3m^2-2mn+4n^2)$

Question 15

- a) $5(y-2)$ b) $8(m+3)$ c) $6(1+2x^2)$
d) $5a(7+2a)$ e) $7b^2(7-b)$ f) $7z^2(5-2z^4)$
g) $9d(5d^4-4)$ h) $13s^2(4s-1)$

Question 16

- a) $5x(5y+3x)$ b) $7mn(2m-3n)$ c) $3a^2b^2(3b-4)$
d) $4xy(x-4y)$ e) $6pq(2p+3q)$ f) $3m^2n^2(9m-5n)$

Question 17

- a) $5a^2b^2(2a+3b^2-1)$ b) $4mn(3n-2-5m)$ c) $5x^2y(4-3y+5xy)$
d) $7ab^2(a^2b+2a-3)$ e) $8x^2y^2(x^2y^2-2xy+4)$ f) $6abc(3a-1+5c-4bc)$

Question 18

- a) $(x+6)(x+4)$ b) $(m+3)(m+2)$ c) $(a+8)(a+2)$ d) $(p+4)(p+4)$
e) $(y+7)(y+6)$ f) $(d+2)(d+2)$ g) $(x-4)(x-3)$ h) $(c-9)(c-8)$
i) $(a-6)(a-1)$ j) $(b-8)(b-4)$ k) $(s-10)(s-2)$ l) $(x-7)(x-7)$

Question 19

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|-------------------|-------------------|--------------------|-------------------|
| a) $(y+5)(y-1)$ | b) $(b+20)(b-1)$ | c) $(p+18)(p-3)$ | d) $(x+14)(x-2)$ |
| e) $(a-4b)(a+6b)$ | f) $(k+61)(k-31)$ | g) $(x-4)(x+2)$ | h) $(n-8)(n+3)$ |
| i) $(a-5)(a+4)$ | j) $(d-9)(d+5)$ | k) $(m-15n)(m+6n)$ | l) $(y-8z)(y+6z)$ |

Question 20 **(ALL ANSWERS COULD BE + OR 1)**

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|-------------------------|-------------|-----------------------|
| a) 9, 11, 19 | b) 1, 4, 11 | c) 12, 13, 14, 20, 37 |
| d) 4, 7, 11, 17, 28, 59 | e) 16, 40 | f) 14, 50 |

Question 21

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|------------------------|-----------------------|-----------------------|
| a) 4, 6, -14, -24, -36 | b) 3, 4, -5, -12, -21 | c) 3, 8, 15, 24, 35 |
| d) 13, 28, 45, 64, 85 | e) 4, 10, 18, 28, 40 | f) 6, 10, 12, -8, -18 |

Question 22

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|--------------------|-------------------|------------------|------------------|
| a) $2(x+1)(x+3)$ | b) $5(a-1)(a+4)$ | c) $3(y+2)(y-6)$ | d) $5(y-4)(y-4)$ |
| e) $2(m+8n)(m-7n)$ | f) $9y(x+1)(x+5)$ | | |

Question 23

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|---------------------|-------------------|-------------------|------------------|
| a) $4(x+3)(x+4)$ | b) $5(a+2)(a-6)$ | c) $3(n-5)(n-4)$ | d) $3(p-4)(p+9)$ |
| d) $7(x+2y)(x-14y)$ | e) $3(a-b)(a-5b)$ | f) $3(a-5b)(a-b)$ | |

Question 24

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|-------------------|---------------------|------------------|-------------------|
| a) $4(y+2)(y-7)$ | b) $3(m+2)(m+4)$ | c) $4(x-3)(x+4)$ | d) $10(x+2)(x+6)$ |
| e) $5a(m-1)(m-7)$ | f) $7d(c-3d)(c-2d)$ | | |