

2A-2B

1 a x^7

b d^{12}

c y^{a+b+c}

d x

e $5k^5$

f $2m^5$

g $30x^8$

h $5s^{-1}$

i $12t^{12}$

2 a x^{12} b $4x^{10}$ c x^6 d x^3
 e $x^{-2} = \frac{1}{x^2}$ f x^7

3 a $7x + 9y$ b $-2a - 3b$
 c $-xy + 8pq$ d $2x + x^2 - 2x^3$
 e $7b^2 + 5b$ f $7y + y^2 + 3y^3$
 g $4abc - xy^2 - 7xy$ h $-pqr - 3abc$
 i $x^2y^2 - 2xy + 6xy^2 + x^2y$

4 a $p^0 = 1$ but then she needs to multiply by 4. Correct answer: 4
 b She has forgotten to square the 7. Correct answer: $49x^6$
 c She has multiplied the powers rather than adding them. Correct answer: $6y^5$
 d She has subtracted the two numbers rather than dividing them. Correct answer: $5a^3$

5 a $-48x$ b $21y$ c $40x^2$ d $70a^3$

6 a $4x$ b 3 c $2a$ d x^2

7 a $2x + 10y$ b $10b - 15c$
 c $3xy - 6xz$ d $4x - 12y + 8z$
 e $p^2 + 2q^2p - 3rp$ f $-2x^3 - 2x^2 + 6x$

8 a $-7a^3b^2$ b $15x^3y^4$ c $3a^2b$ d $\frac{3r}{4pq^4}$

9 a $\frac{x^2y^2z^2}{y^2}$ b $\frac{x^3}{yz}$ c $3x^4y^6$ d $6x^2y^2z^7$
 e x^{25} f $4x^6 + 4x^9$

2C-2D

1 a $1\frac{3}{14}$ b $\frac{27}{40}$ c $\frac{35}{36}$

2 a $\frac{9a}{20}$ b $\frac{17a}{20}$ c $\frac{29a}{30}$ d $\frac{6x+7y}{14}$

e $\frac{6x+4y+3z}{12}$ f $\frac{10y+12z+15x}{30}$

3 a $3x+4y$ b $8x+10y$ c $\frac{1}{3x+4y}$ d $x+3y$

4 Equivalent: $\frac{12x+16}{4}$, $\frac{1.5x+2}{0.5}$, $\frac{8x+15+7x+5}{5}$, $\frac{1}{6}(18x+24)$

Not equivalent: $\frac{3x+12}{3}$, $\frac{1}{3x+4}$, $\frac{10x-(-20x+40)}{10}$

5 Jamil has not fully simplified the expression. The fully simplified answer is $2x - 7$

6 a $\frac{10y}{7}$ b $\frac{2y+3}{y}$ c $\frac{7x-2}{x}$ d $\frac{8+6x}{12}$

e $\frac{2xy+z}{xyz}$ f $\frac{3x^2y+2yz^2}{6xz}$

7 a $\$ \frac{2.5}{x} = \$ \frac{5}{2x}$ b $\$ \frac{3.75}{y} = \$ \frac{15}{4y}$

c $\$ \frac{15x+10y}{4xy}$

8 a $\frac{5x-1}{6}$ b $\frac{-x-4}{(x+1)(x+2)}$

2E-2F

1 a $x^2 + 5x + 6$

2 a $x^2 + 5x + 4$

c $x^2 + 9x + 20$

e $x^2 + 3x - 18$

3 a $x^2 - 7x + 10$

c $x^2 - 10x + 24$

e $x^2 - 15x + 26$

4 a $x^2 + 6x + 9$

c $16 - 8x + x^2$

5 a $x^2 - 16x + 55$

6 a $x^2 - 9$ b $x^2 - 144$

7 a 6 b 15 c 8, 8 d a, b, a, b

8 Students' answers, e.g.

$$(x+1)(x+2)(x+3) = (x+1)(x^2 + 5x + 6)$$

$$= x^3 + 6x^2 + 11x + 6$$

2G

1 a -150 b -112 c 900 d 1.75

e $-3\frac{2}{3}$ f $-1\frac{1}{2}$

2 a 0.12 b -0.6 c 0.000576

d 22.5 e $-1\frac{2}{3}$ f -0.65

3 a $V = 15$ volts b $V = 216$ volts

4 a 133.5 minutes b 169.5 minutes

c 106.5 minutes

5 a 14 cm b 31.4 cm c 26.8 cm

6 a $\frac{25}{9}$ b 36 c 0.62