Answer Key Chapter 2

Student book

Chapter 2

Check in

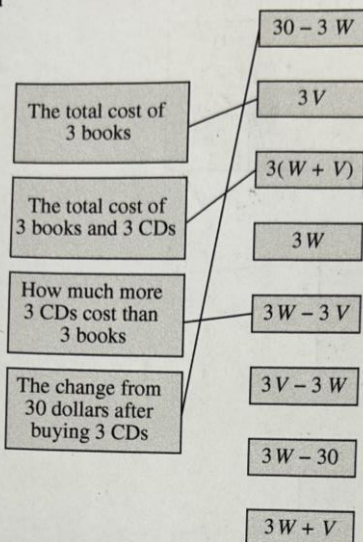1 a 4   b -14   c -5   d 10
2 a $3m$ b $6y$ c $10r$ d $5c$
3 a $6\,cm^2$ b $39\,cm^2$ c $58.5\,m^2$

Exercise 2A

1 $A = wl$ and $V = IR$ are formulae
   $3y + 2x$ and $4t + 7$ are expressions
   $3p - 1 = 29$ and $7n + 3 = 2n + 23$ are equations

2 a $S - 6$ b $S + 10$ c $5S$ d $\dfrac{S}{2}$

3 a $14x$ b $3m$ c $2x + 2p + 14$
   d $2a + 2b + c$

4 a $\$3k + p$ b $\$km + pt$

5 $\$0.5K + 2$

6 $1.8C + 32$

7 $2P$

8 a

b $3W$ = the total cost of 3 CDs
   $3V - 3W$ = how much more 3 books cost than 3 CDs
   $3W - 30$ = the cost of 3CDs minus \$30 (perhaps a gift voucher)
   $3W + V$ = the total cost of 3CDs and 1 book

9 Copy and complete the table about the unknown number n.

Expression	Meaning
$\frac{1}{2}n$	Half the number
$3(n - 2)$	Start with the number, subtract 2 from it, then multiply that answer by 3
$\frac{1}{2}n + 5$	**Halve the number then add 5**
$\frac{1}{2}(n + 5)$	Add 5 to the number then halve it
$20 - 2n$	**Start with 20 and subtract double the number from it**
$2(n + 6)$	Start with the number, add 6 to it, then double it

10 a Double the number of Debbie's pens and add to the number of Kulwinder's pens
    b Three times the total of Kulwinder and Debbie's pens
    c Halve the number of Debbie's pens and then subtract the number of Kulwinder's pens

11 a $5(v + 7)$ b $\frac{1}{2}(w - 2)$ c $\frac{1}{2}xy$ d z^2

12 a $10.5rt$ b $\frac{5}{2}mn$

13 $7x + 15$ cm

14 a $4x + 9$ b 14   c 33   d 21
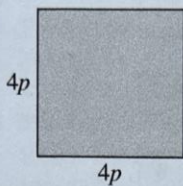15 $\$8x + 0.09r$
16 $0.9S$

Exercise 2B

1 **a** $3x + 6$　　**b** $8x - 24$　　**c** $5x - 15$　　**d** $24 - 18x$
　e $x^2 + 5x$　　**f** $3x^2 + 12x$　　**g** $6m^2 + 14m$　**h** $35p - 10p^2$
　i $5m^3 + 15cm^2$ **j** $10x^3 - 14x^2y$

2 **a** $2x^2 + 14x$　**b** $28y - 12y^2$　**c** $10x^2 + 25xy$ **d** $21xy + 42y^2$

3 a
　　　　　$x + 3$

　4

b $4x + 12$

4 a

　$4p$

　　　$4p$

b $16p^2$

5 a
　　　$t + 4$

　　　　　　$t + 4$
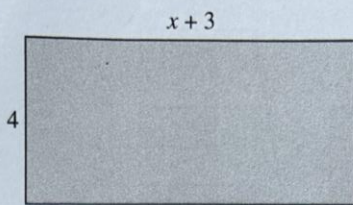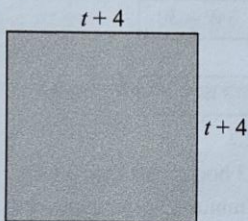
b $t^2 + 8t + 16$

6 **a** $18x - 15y$　**b** $-10y$　　**c** $13x^2 - 3x$　**d** $y + 3y^2$

7 **a** Sunil and Helga are correct. We usually write the letters in alphabetical order so Helga's is the more usual form.

　b mp^2 is the same as p^2m, the order of multiplying does not matter

　c Ricardo added the number parts instead of multiplying. Diego put the power of 2 with the m instead of the p in the second term.

8 **a** $12x + 20$　**b** $15x + 39y$

9 $-6x - 5 = 5 -2(3x + 5)$; $6 + 15x = 5 - 3(4 - 5x) + 13$; $5(3x + 2) - 9x - 7 = 4(2x - 1) - (2x - 7)$ are both equal to $6x + 3$, so the odd one out is $6x - 11$

10 **a** $12xy + 4x^2 - 8px$
　b $56xy^2 - 64ty^2 + 72y^3$
　c $-m^3 + 8m^2 + 9m^2t - m^2y$

11 **a** 8　　**b** 6　　**c** 13　　**d** $7; 91y$

12 **a** $3y^2 - y$　**b** $3x + 3x^2 + 2x^3$　**c** $2x - 5x^2$　**d** $2y - 6y^2$
　e $3y + y^2$　**f** $22 - 6c$　　**g** $-5m$　　**h** $19h - 4f$

13 **a** 2 and 56　**b** 5 and 3　　**c** 4 and $24py$

14 $2x + 3$

15 **a** $2x - 10y$　**b** $4x - xy$　　**c** $-12x - 2x^2$

Exercise 2C

1 **a** $3(x + y)$　　　**b** $5(a - b)$　　　**c** $4(x + y + z)$
　d $6(a - b + c)$　　**e** $2(x + 3y)$　　**f** $4(2a - b)$
　g $3(x + 2y + 3z)$　**h** $5(5a - 2b - c)$

2 **a** $a(x + y)$　　　**b** $p(a - b)$　　　**c** $p(x + y + z)$
　d $r(a - b + c)$　　**e** $q(x + 3y)$　　**f** $s(5a - b)$
　g $t(2x + 5y + z)$　**h** $l(7a - 4b - c)$

3 **a** $m(3 + 5n + m)$　**b** $p(2 + 3r + p)$　　**c** $2l(3 + m + l)$
　d $5rs(1 + 10s + 3r)$

4 He has not fully factorised, it should be $12(3x + y)$

5 Any three expressions that cannot be factorised

6 **a** $2(a + b)$　　　**b** $3(a - b)$　　　**c** $4(x + 3y)$
　d $3(3p - 2q)$　　**e** $p(x + y)$　　**f** $r(a - b)$
　g $s(7x + 4y)$　　**h** $t(2a - 7b)$　　**i** $x(a + b + c)$
　j $l(a - b - c)$　　**k** $r(4x + 5y + z)$　**l** $p(a - 6b + 8c)$

7 For example, $2x$ and $x + 6$

8 **a** $x(l + m)$　　**b** $n(a - b)$　　　**c** $y(7p + 2q)$
　d $t(r - 5s)$　　**e** $t(p + q + r)$　　**f** $n(a + b - c)$
　g $x(5l + m + 2n)$　**h** $g(4k - 2l - m)$

9 Three different integer multiples of $3x + 1$

10 **a** $2p(2 + r + 3z)$　**b** $5m(1 + 3p + 5g)$　**c** $3s(3r + 1 + 2s)$
　d $2m(2l + n + 4pn)$　**e** $ab^2(1 + 6b + 2a)$　**f** $3xy^2(x + 1)$

11 1 and $8t^2 + 12t$, 2 and $4t^2 + 6t$, 4 and $2t^2 + 3t$, t and $8t + 12$, $2t$ and $4t + 6$, $4t$ and $2t + 3$

12 **a** $x(x + 3)$　　**b** $y(y - 5)$　　　**c** $z(2z + 3)$
　d $m(4m - 1)$　　**e** $x(x^2 + 2y)$　　**f** $y^2(4z - y)$
　g $ab(b + a)$　　**h** $xyz^2(x - z)$　　**i** $pr(r + 2h)$
　j $2lm(m + 4l)$　　**k** $x^2(x^2 + x + 1)$　**l** $8y(4 + 2y^2 + y^4)$

13 $20x + 6$

14 **a** $ab(c^2 + b + a)$　**b** $pq^2r(p^2 + pr + r^2)$ **c** $7xy(a + 2b + 3c)$
　d $8x^3(x^3 + 2x + 6)$　**e** $lm(2p - 1 + 5m)$　**f** $fg^2(f^3 - 6fg + 2g^2)$
　g $5bcd(a + 7e)$　　**h** $8klm^2n(3k - 4ln^2)$
　i $4cx(4ab - 7bd - 5de)$

15 **a** $7(x - 4)$　　**b** $11x(1 - y)$　　**c** $c(a + b + 3)$
　d $7lm(l + m)$

16 $3x$ and $12x + 2$

17 **a** $xy(x + 3 + 4y)$　　　　**b** $2rs(1 + 9t + 4rs + 5t^2)$

　c $2mn(7n + 1 + 4m + 4mn)$　**d** $g^2h\left(\dfrac{1}{3} + \dfrac{5}{3}g + 2gh^2\right)$

　e $xy(x + 2y + xy^2 + x^3y^3)$

Exercise 2D

1 **a** 17   **b** 6   **c** 49   **d** 4
   e 32   **f** 20   **g** 34

2 **a** $^-11$ **b** 3   **c** $^-36$ **d** 99
   e $^-480$ **f** 0   **g** 20   **h** $^-30$
   i $^-14$ **j** 0   **k** 3   **l** 1

3 **a** 12   **b** $^-1$ **c** 32
   d 75   **e** 36   **f** $^-250$

4 **a** 13   **b** 13   **c** 2   **d** 50
   e 0   **f** 2   **g** 28   **h** 34

5 **a i** 10   **ii** 14   **b i** 8   **ii** $^-28$
   c i 31   **ii** 31   **d i** 49   **ii** $^-23$
   e i $^-35$ **ii** $^-35$

6 **a** 12   **b** 76   **c** 54   **d** 38   **e** $^-18$

7 $2x + y^2$ and $4y^2 - x^2 + x$ are both worth 10

8
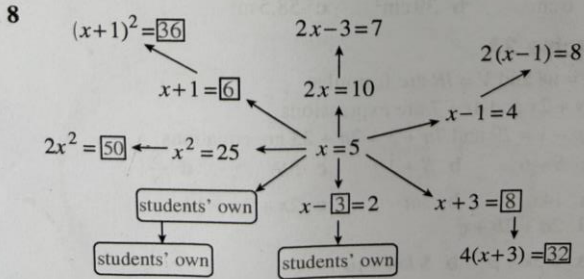
9 **a** You always get the answer 2
   b You always get the answer 3

10 $m = 5$ and $p = 4$

11a $3n + 2$
   b Mean with $n = 6$ is 20, which is $3n + 2$ ($3 \times 6 + 2 = 20$)

Exercise 2

1 $F = ma$ — formula
   $7y - 2x$ — expression
   $2p = 27 - p$ — equation
   $y + 9$ — expression
   $V = Al$ — formula
   $6y + 1 = 3y + 7$ — equation

2 $\frac{5}{8}H$

3 **a** $4(g + 2)$ **b** $2(h - 7)$ **c** $2jk$ **d** $\frac{m^2}{2}$

4 **a** $26x^2$ **b** $\frac{3xy}{4}$

5 **a** $5x - 15$ **b** $18x + 72$ **c** $12 + 21y$ **d** $84m - 144p$

7 **a** $7x + 6$ **b** $28 + 26y$ **c** $20x - 26$ **d** $12 - 14t$

8 **a** $5x + 40$ **b** $22d - 44$

9 **a** 5   **b** 4   **c** 10   **d** $5; 60m$

10 $2x + 3$

11 $65x - 62$

12 a $3(x + 3y)$ **b** $2(a - 2b)$ **c** $6(x - 2y)$
   d $7(2x - y)$ **e** $3(5x + 6y)$ **f** $6(x + 12y)$
   g $6(x - 4y)$ **h** $a(x + y)$

13 a $a(x + 3y)$ **b** $a(n - 3m)$ **c** $2r(3x + y)$
   d $3a(x - 6y)$ **e** $5m(n - p)$ **f** $p(4q - 3r)$
   g $2r(3 + 2p - q)$ **h** $a(3b - 3 + c)$

14 a 5   **b** 1   **c** 4   **d** 45

15 a 12   **b** 15   **c** $^-14$
   d 16   **e** 0   **f** 20

Summary

Check out

1 **a i** $35x + 10$ **ii** $14x + 14$
   b i $132p - 144$ **ii** $22p$

2 **a** $8x - 12$ **b** $12x + 42y$ **c** $6x - 12xy$
   d $18x^2 - 24x^3$ **e** $3x - 2y + 10xy$ **f** $10y - 7y^2$

3 **a** $5(4x + 3y)$ **b** $x(3 - x)$ **c** $x(4y - x)$ **d** $6(x + 12)$

4 **a** $^-4.5$ **b** 10   **c** 5   **d** 4.5

Answer Key Chapter 2

Homework book

2A

1 **a** Expression **b** Equation **c** Formula
 d Formula **e** Expression **f** Equation

2 $c + 15$

3 $\dfrac{x}{5}$

4 $20 - b$

5 $10 + 5n$

6 $5x + 7y$

7 **a** $10x + 6y$ **b** $7x + 2y + 7$

8 **a** $5x + 20$ **b** **i** 40 **ii** 20

9 $y(16 + 0.07x)$

2B

1 **a** $4x + 12$ **b** $6x - 8$
 c $-6y + 15$ **d** $16y + 56$
 e $x^2 + 2x$ **f** $y^2 - 4y$
 g $4h^2 + 3h$ **h** $35x - 15x^2$
 i $6y^2 + 10y$

2 **a** $4x + 12$ **b** $10y - 5$ **c** $x^2 + 7x$

3 **a** $7x + 26$ **b** $7y - 2$ **c** $14x + 10$ **d** $18 - 10y$
 e $-x + 6$ **f** $-5x - 17$ **g** $8 - 8y$ **h** $6y + 23$
 i $2x^3 + 2x^2 + 2x$ **j** $-12y^2 + 2y$

4 **a** $3(x - \boxed{5}) = 3x - 15$
 b $\boxed{6}(2x + 5) = 12x + 30$

5 $11x^2 - 23x$

6 **a** $20x + 20$ **b** $12x + 48y$

2C

1 **a** $2x - 2y = 2(x - y)$
 b $10a - 15b = 5(2a - 3b)$
 c $15x - 3y + 9z = 3(5x - y + 3z)$
 d $px + py - pz = p(x + y - z)$
 e $2xa - xb = x(2a - b)$
 f $3lx - 6ly = 3l(x - 2y)$

2 **a** $cy - dy = (c - d)y$
 b $3mz - lnz + 2pz = (3m - ln + 2p)z$
 c $2x + 4xy + 6x^2 = 2x(1 + 2y + 3x)$

3 **a** $2(x - y)$ **b** $5(x - 4y)$
 c $a(x - y)$ **d** $p(x - 2y + 7z)$
 e $x(3a - 4b + 2c)$ **f** $2x(3a + 2b + c)$
 g $3x(2x + 1 + 3y)$ **h** $5x(x + 2xy - 3y^2)$
 i $x(x - 5)$

4 **a** $x(x^2 - 6y)$ **b** $ab^2c(ab - 1)$
 c $3y(9 - 3y^2 + y^3)$ **d** $xyz(x^2 + xz - yz^2)$
 e $7cd(ab - 3be + 2ef)$ **f** $4x^2y^2z^2(-2xy^2 - 4yz^2 + x^2z)$

5 **a** $x(16 - 9y)$ **b** $5a^2b + ab^2 + 6a^2 + 2b$

6 $16x + 14$

7 $6x$ and $2x + 7$

2D

1 **a** 21 **b** 21 **c** 20 **d** 18
 e 15 **f** 54 **g** 5 **h** 2
 i -4 **j** 23 **k** 97 **l** 131
 m 51 **n** 2 **o** 23 **p** 46
 q 413 **r** 148

2 **a** -34 **b** -48 **c** 29 **d** 48
 e 4 **f** 17 **g** -12 **h** -5
 i -2 **j** -8 **k** 38 **l** 11
 m -17 **n** -10 **o** -160 **p** 308
 q 106 **r** 20

3 **a** 1 **b** -1 **c** -1 **d** 1
 e 1 **f** -1

4 $(xy - x)^3$

5 $-5xy$ and $3y^2 - 5y$ both have the value 100

6 **a** $2x + 1$ **b** Students' own answer **c** No