

Answer Key Chapter 7

Student book

Chapter 7

Check in

- 1 a 48 b 16 c 11 d 3
 2 a i $8p - 20$ ii $-15 + 10x$
 b i $22p + 15m$ ii $40 + 50x$
 3 a 40 b 44 c 25

Exercise 7B

- 1 a i 17 ii 38
 b i 18 ii 46

- c i 26 ii 61
 2 a $-2, \div 3$ b $+2, \div 4$ c $-1, \div 5$
 3 a 8 b 7 c 5
 4 a $3x + 2$ b $4x - 2$ c $5x + 1$

Exercise 7A

- 1 a 30 miles b 50 miles c 20 miles
 2 a $k = \frac{8m}{5}$ b i 80 km ii 120 km
 3 a i 86°F ii 176°F iii 53.6°F
 b $F = 2C + 32$
 c i 92°F ii 192°F iii 56°F
 4 a $A = mn$ b $P = 2m + 2n$ c $A = 45\text{ cm}^2$ $P = 36\text{ cm}$
 5 $V = lwd$
 6 a An equation involves constant terms; a formula involves variable terms.
 b $2a - 4 = 3$ is an equation
 7 $T = 30h + 20$
 8 No, there should not be brackets. The formula should be $T = 20x + 3$
 9 a $f = 4n + 1$ b $c = 2n - 1$
 c $f + c = 4n + 1 + 2n - 1 = 6n$; she is right
 10 a 45 cm^2 b 140 cm^2 c $A = x(x + 4)$
 11 $T = 2x + 5y + 3$
 12 a \$396 b $T = 12hd + 3d$
 13 $T = 2n + 4$
 14 All of them
 15 a $t = 4n$ b $f = 8n + 4$ c $f = 100$ d $n = 9$
 16 $l = \frac{V}{wd}$
 17 $m = \frac{P - 2n}{2}$
 18 $C = \frac{5}{9}(F - 32)$

Exercise 7C

- 1 b $2x$ has been taken from both sides. The two sides still balance.
 c $3x + 1 = 10$
 d yes
 e 3 kg
 2 a 14 b 3 c $4x - 5$ d $9x$
 3 a He should have added 4 to both sides of the equation.
 b $x = 5$
 4 b, d, e, f and g are the most helpful. g may be the best to use.
 5 a All of them
 b $15 = 2x + 5$
 6 a $x = 2$ b $x = 5$ c $x = 1$ d $x = 2$
 7 a $x = 1$ b $x = 3$ c $x = 5$ d $x = 4$
 e $x = 2\frac{1}{2}$ f $x = 5$ g $x = 4$ h $x = 3$
 8 a $x = 2$ b $x = 10$ c $x = 3$ d $x = 12$
 e $x = 3$ f $x = 6$ g $p = 3$ h $x = 12$
 i $x = 7$ j $x = 1$ k $x = 45$ l $x = 2$
 m $x = 1$ n $x = 3$
 10 a $x = 12$ b $x = 35$ c $x = 36$
 11 a $x = 28$ b $x = 5$ c $x = 87$
 12 If you add 5 to something, it can't stay the same thing. If you subtract $3x$ from both sides, you end up with $5 = 0$ which cannot be true.
 13 Equating opposite sides gives $x = 3$ as the solution and parallel sides are 6 cm and 10 cm for each pair.

Exercise 7D

- 1 a $x=4$ b $t=7$ c $x=10$ d $m=6$
e $x=4$ f $x=3.5$ g $x=2$ h $x=10$
i $x=13$ j $p=1$ k $x=7$ l $d=7.5$
- 2 Students' answers may differ. Suggested answer and reason are:
a A $5(x-2)=6$ $4(x+3)=17$ B $7(x-3)=35$ $6(x+3)=36$
b When the number in front of the brackets is a factor of the number on the right-hand side, it may be easier to divide first, BUT you can ALWAYS divide first if you want to.
- 3 a c, e, f and g are true, the others are false
- 4 a $x=2\frac{1}{3}$ b $x=2$ c $x=6\frac{2}{3}$
d $x=7$ e $x=20$ f $x=7$
- 5 a The arithmetic in Samina's method is easier, as she does not have to do a long multiplication (2-digit number \times 2-digit number).
b Ben's method is easier as you do not end up with a decimal in your first step.
- 6 a $x=24$ b $x=160$ c $x=90$ d $x=20$ e $x=16$ f $x=12$

Exercise 7E

- 1 35
2 46
3 45, 46
4 11 cm
5 a 7 cm b 6.15 cm c 3.55 cm
6 6
7 110°
8 3
6 8 cm, 10 cm, 16 cm
7 Safiya, 16; Janet, 10
8 Anton, 60; Kamil, 20; Abdul 16
9 12
13 106, 108
14 79, 81, 83
15 a 7 b 8 c 12 d 11

Exercise 7F

- 1 a 70 b 20
2 a 10 b 2
3 a 50 b 65
4 a 2 b 0.5
5 a 8 b 14
6 a 3 b 2.5
7 She hasn't divided the 20 by 10
8 40
9 $s-ut = \frac{1}{2}at^2$ $s - \frac{1}{2}at^2 = ut$ $2s = 2ut + at^2$
10 20
11 a 42 b 0.5
12 200
13 10
14 8
15 5

Exercise 7G

- 1 a $t-u=v$ b $d-h=y$ c $x+3=f$
d $\frac{(m-g)}{2}=c$ e $b=ns$ f $d=\frac{af}{e}$ g $f+\frac{q}{3}=x$
2 a $T \rightarrow \times RP \rightarrow \div 100 \rightarrow I$
b $T \leftarrow \div RP \leftarrow \times 100 \leftarrow I$
 $T = \frac{I \times 100}{R \times p}$

- 3 a $F \rightarrow \div 32 \rightarrow \div 9 \rightarrow \times 5 \rightarrow C$
b i 5° ii 15° iii 30° iv 100°
4 a $F \leftarrow + 32 \leftarrow \times 9 \leftarrow \div 5 \leftarrow C$
b $F = \frac{9}{5}C + 32$ c i 122° ii 176°
5 a $l \rightarrow \times bh \rightarrow V$ b $r \rightarrow \times 2\pi h \rightarrow S$
c $t \rightarrow \times a \rightarrow + u \rightarrow v$
6 a $l = V + bh$ b $r = S + 2\pi h$ c $t = (v-u) + a$
7 a $r = A + h$ b $r = A + 2\pi h$
8 a i $x \rightarrow \times p \rightarrow + q \rightarrow y$ ii $x \rightarrow -l \rightarrow \times k \rightarrow y$
b i $x = (y-q) \div p$ ii $x = l + y + k$
9 a $P = 4x - 2$ b $\frac{(p+2)}{4} = x$
c $x = 8$ d triangle is 5 by 12 by 13

Exercise 7H

- 1 a $y = C - x$ b $y = \frac{(T-3x)}{2}$ c $y = \frac{4P}{3}$
 d $y = \frac{3}{2}S - 6$
- 2 a $R^2 = \frac{V}{1} - R^1$ b $I = \frac{V}{(R_1 + R_2)}$
- 3 a $R = \frac{100I}{PT}$ b $P + \frac{100I}{RT}$
- 4 a $P_0 \frac{P}{(1 + \alpha t)}$ b $\alpha = \frac{(P - P_0)}{P_0 t}$ c $t = \frac{(P - P_0)}{P_0 \alpha}$

5

Group 1

a $2t = 8 - 4n$

Group 1

a $2t = 8 - 4n$

d $4n = 8 - 2t$

f $n = 2 - \frac{1}{2}t$

g $t = 4 - 2n$

h $2t + 4n = 8$

Group 2

b $2t + 8 = -4n$

c $t = -4 - 2n$

e $4n + 2t = -8$

i $2t = -4n - 8$

k $n = -2 - \frac{1}{2}t$

l $4n = -8 - 2t$

6 a $l = \frac{A}{b}$ b $r = \frac{C}{2\pi}$ c $l = \frac{V}{R}$ d $L = \frac{S}{\pi r}$

e $f = \frac{(v-u)}{t}$ f $x = \frac{(y-c)}{m}$ g $T = \frac{PV}{R}$ h $R = \frac{E}{I}$

7 Many answers including:

$x + 5 = 4p$

$\frac{x+5}{4} = p$

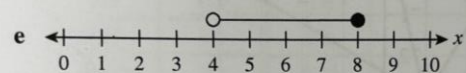
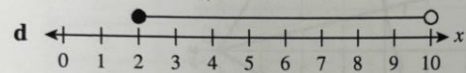
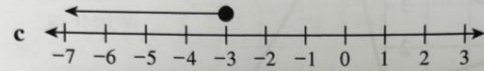
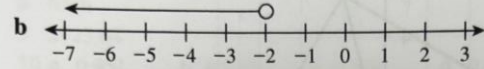
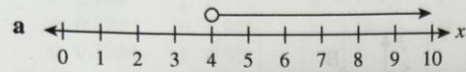
$x + 5 - 4p = 0$

$-x - 5 = -4p$

$\frac{-x-5}{4} = -p$

Exercise 7I

1



2 a $x \leq 30$

b $x \geq 3$

c $x < -1$

d $1 \leq x \leq 9$

e $2 < x < 6$

f $4 \leq x < 9$

3 a 30 b 3 c -2 d 1

e 5 f 4

4 4, 5, 6, and 7

5 -1

6 $15 \leq m < 45$

7 No, as $x \leq 7$ does not include any values greater than 7, but $x < 8$ does, e.g. 7.5 doesn't satisfy the first inequality but does satisfy the second.

8 a $x + 1 \leq 10$ b $3x \leq 27$ c $x - 3 \leq 6$ d $\frac{x}{2} \leq 4.5$

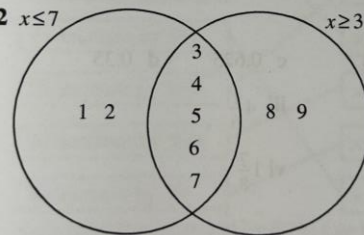
9 a $7 \leq x + 5 < 10$ b $4 \leq 2x < 10$ c $1 \leq x - 1 < 4$

10 Students' own answers equivalent to $x \leq 10$, e.g. $x + 1 \leq 11$, $2x \leq 20$, $x - 3 \leq 7$

11 a A, B or C

b D

12 $x \leq 7$ $x \geq 3$



13 Only $7 < x$ and $14 < 2x$ are true

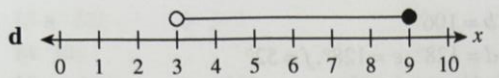
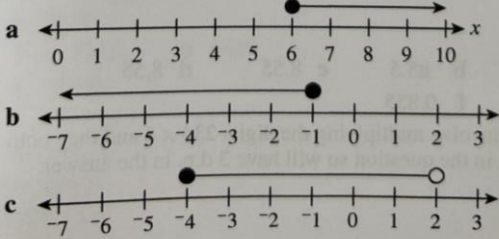
14 a If you add two sides together they must be longer than the third side $3 + 3$ is less than 10 so it is not possible.

b $x + x > 10$ or $x > 5$

Exercise 7

- 1 a $x=8$ b $x=4$ c $x=3$ d $y=3$
 e $x=5$ f $d=8$ g $x=10$ h $x=2$

2

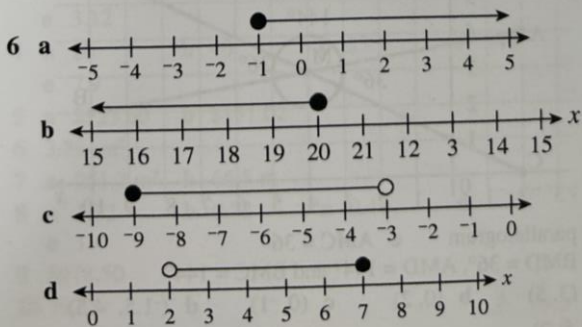


- 3 a $v = \frac{(b-p)}{2}$ b $h = y - T$ c $m = 3(x - y)$
 d $r = \frac{y}{2} - P$ e $n = \frac{b}{j}$ f $s = hy - d$
- 4 a $x \leq 35$ b $x \geq 1$ c $x < 4$
 d $-1 \leq x \leq 7$ e $5 < x < 9$ f $1 \leq x < 6$
- 5 a 12 b $4n$ c 15
 d $t = 5n$ e 24
- 6 -2, -1, 0, 1, 2, 3
- 7 a $P = 4y + 2x + 16$ b $A = 33d - 44m$
 c $y = 5$ d $d = 6$
- 8 a $x + 2 \leq 5$ b $5x \leq 15$ c $x - 4 \leq -1$
- 9 $n = 31$
- 10 a $7 \leq x + 7 < 11$ b $0 \leq 2x < 8$ c $-3 \leq x - 3 < 1$

Summary

Check out

- 1 a $7(2x - 3) = A$ b 6
 2 a $x = 9$ b $y = 8$ c $m = 4$ d $x = 3$
 3 7
 4 length 9 cm, width 5 cm
 5 a $x = \frac{t-m}{5}$ b $x = 3k - 1$ c $x = \frac{y}{4} + r$



Answer Key Chapter 7

Homework book

7A

- 1 a $x + y = 35$ b $x - 15 = y$ c $x = 2y$
 2 a 50 b 37.4 c 77
 3 a $6x + 6$ b $2x^2 + 3x$ or $x(2x + 3)$
 4 a $24x^2 + 40x$ or $8x(3x + 5)$ b $12x^2 + 60x + 40$
 5 a $y = 2x^2 - 8$ b ± 7

7B-7F

- 1 a $-1\frac{1}{2}$ b $-\frac{1}{3}$ c $-1\frac{2}{7}$ d $-3\frac{1}{2}$
 e $-1\frac{2}{3}$ f $-2\frac{1}{2}$ g $-5\frac{2}{3}$ h $-2\frac{2}{5}$
 i $-6\frac{1}{2}$
 2 a 20 b 9 c 36 d 20
 e 6 f 30 g 8 h 12
 i 8
 3 a 7 b 6 c 3 d 8
 e 3 f 2 g 4 h 7
 4 a 11 b 4 c 8 d $5\frac{1}{2}$
 e $2\frac{1}{3}$ f 3 g 9 h 23
 i $18\frac{1}{2}$
 5 a 16 b 26 c $4\frac{1}{2}$ d 31
 e 6 f 7

6 $7\frac{1}{2}$

7 30

8 11

9 92, 94, 96

10 14

11 a 150 b 54 c 1.5

12 a -96 b 4

13 a 100 b 3

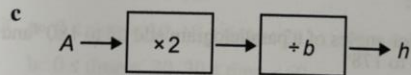
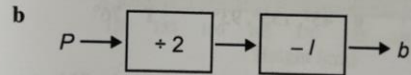
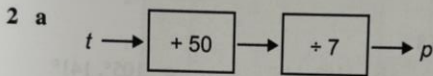
14 a 7 b 23 c 3 d 6

15 a 4 b ± 20 c 6.4

16 ± 7

7G-7H

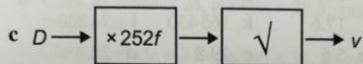
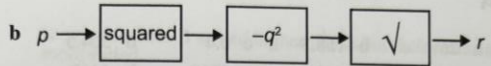
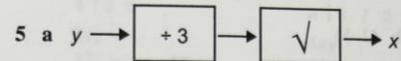
- 1 a $d = \frac{b-c^2}{a}$ b $z = (y-x)^2$
 c $x = \frac{z}{y}$ d $c = d(a-b)$
 e $r = \frac{1}{mpq}$ f $c = \frac{adef}{b}$



3 a $p = \frac{t+50}{7}$ b $b = \frac{P}{2} - 1$

c $h = \frac{2A}{b}$

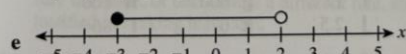
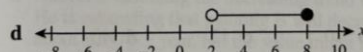
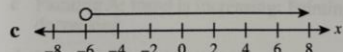
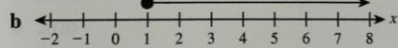
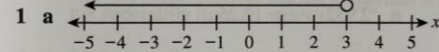
4 a $R = \left(\frac{t}{s}\right)^2$ b $t = s\sqrt{R}$



6 a $x = \frac{ay}{y-b}$ b $y = \frac{bx}{x-a}$

c $a = x - \frac{bx}{y}$ d $b = y - \frac{ay}{x}$

7I



2 a $x < 3$ b $x \geq 1$ c $x > -6$

d $2 \leq x \leq 8$ e $-3 \leq x < 2$

3 1

4 5, 6, 7, 8