Algebra Exercises: Answers

Exercise 1A

1 a 40 b 40 c 64 d 64

2 a $3x + 3y$ b $7a + 7b$ c $7m + 7n$
d $9x + 36$ e $6y + 42$ f $10p + 80$
g $8a + 32$ h $9c + 45$ i $5b + 45$
j $36 + 6p$ k $84 + 7q$ l $40 + 8n$

3 a $5x - 5y$ b $7a - 7b$ c $9m - 9n$
d $8x - 56$ e $3x - 27$ f $9x - 108$
g $26 - 2m$ h $56 - 8q$ i $36 - 4p$
j $56 - 8x$ k $54 - 3b$ l $60 - 4m$

4 a $xy + xz$ b $mp + mq$ c $ab + ac$
d $rs - rt$ e $pq - pr$ f $lm - ln$
g $mn - 8m$ h $ab - 12a$ i $yz - 8z$
j $9c - bc$ k $14p - pq$ l $9m - mn$

5 a $24x + 16$ b $20y + 30$ c $63b + 28$
d $35q - 30$ e $54p - 108$ f $24s - 56$
g $8x + 20y$ h $30m + 45n$ i $56a + 84b$
j $18a - 42b$ k $88m - 66n$ l $18m - 27n$

6 a $6x + 27$ b $49y + 3$
c $15m + 34$ d $9b + 12$
e $8a + 17b + 16c$ f $12x^2 + 8x$
g $6x^2 + 13x + 6$ h $30y^2 + 48y$
i $18x^2 + 7x$ j $2mp$

7 a $6n + 18$ b $7n - 28$ c $8n + 12$
d $12n - 18$ e $2n - 12$

8 a $a + c$ b $3a + 1{\cdot}5c$
c $5(3a + 1{\cdot}5c)$ d $15a + 7{\cdot}5c$

Exercise 1B

1 a 13 cm b 20 cm

2 a 108 cm^2 b 42 m^2

3 a i 46 points ii 57 points
b $20 = 6b + g$
possible answers:
0 goals 20 points
1 goal 14 points
2 goals 8 points
3 goals 2 points

4 a 11 b 41 c 67

5 a i 13 ii 16
b 4, 7, 10, 13, 16, 19, 21, 24, 24, 30
c $N = 1 + 3R$

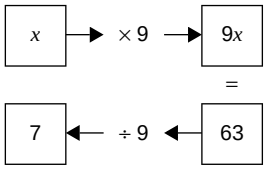
6 a i 18 ii 22
b 6, 10, 14, 18, 22, 26, 30, 34, 38, 42
c $N = 2 + 4A$

7 a i \$55 ii \$62·50 iii \$75 iv $0{\cdot}5n + 50$
b $C = 0{\cdot}5n + 50$
c C = \$55 for 10 programs
d C = \$125

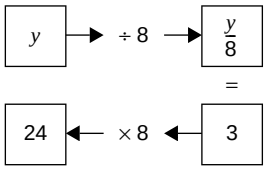
8 a i \$40 ii \$55 iii \$70 iv $5n + 30$
b $A = 5n + 30$ c A = \$55
d It will take 21 weeks

Exercise 1C

1 Complete the flow chart

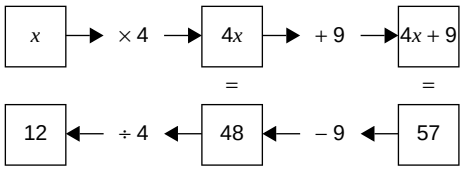


2 Complete the flow chart



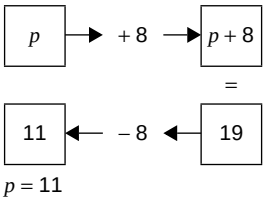
The solution is then $y = 24$

3



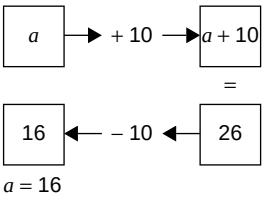
The solution is then $x = 12$

4 a



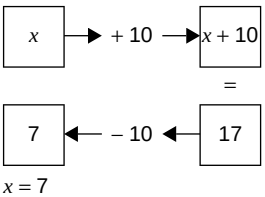
$p = 11$

b



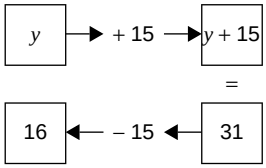
$a = 16$

c



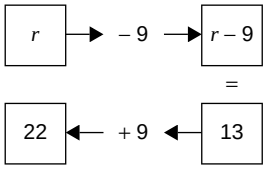
$x = 7$

d



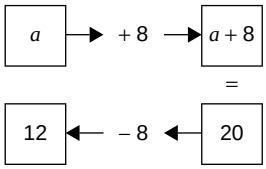
$y = 16$

e



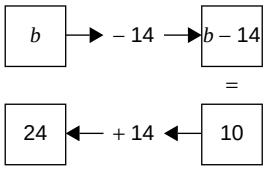
$r = 22$

f



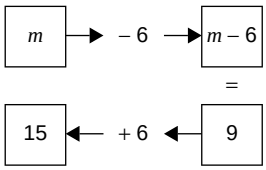
$a = 12$

g



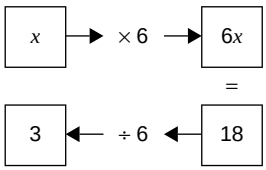
$b = 24$

h



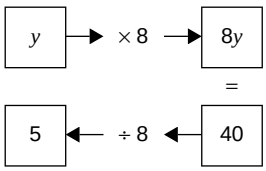
$m = 15$

5 a



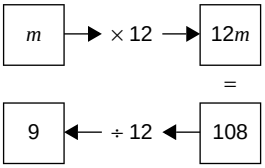
$x = 3$

b



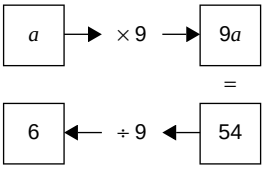
$y = 5$

c



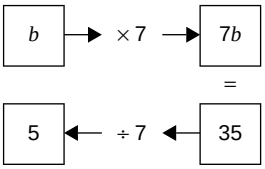
$m = 9$

d



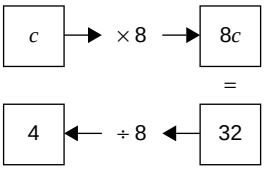
$a = 6$

e



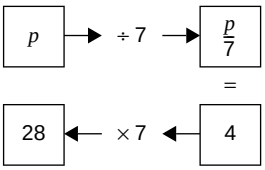
$b = 5$

f



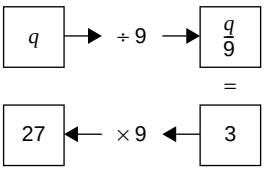
$c = 4$

g



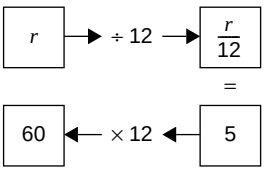
$p = 28$

h



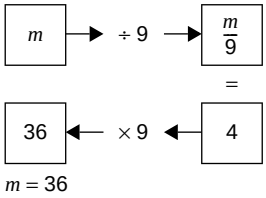
$q = 27$

i



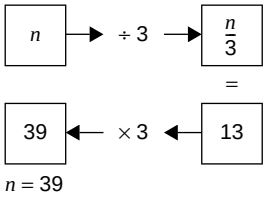
$r = 60$

j



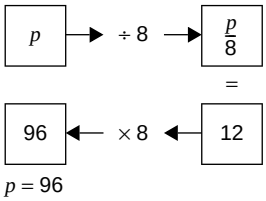
$m = 36$

k



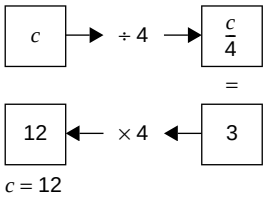
$n = 39$

l



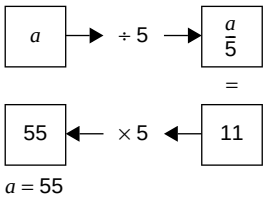
$p = 96$

m



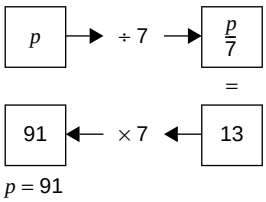
$c = 12$

n



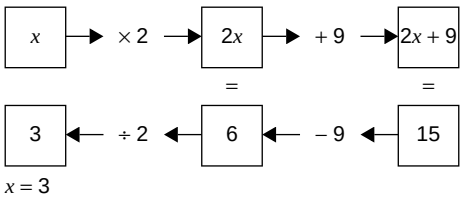
$a = 55$

o



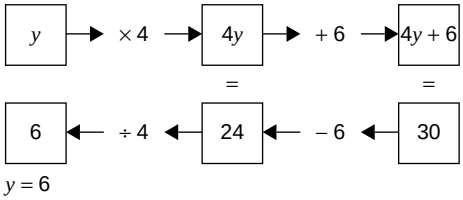
$p = 91$

6 a



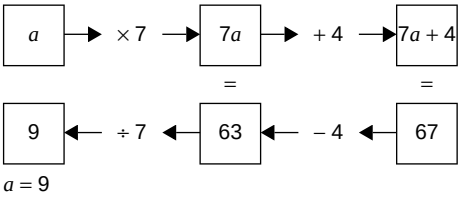
$x = 3$

b



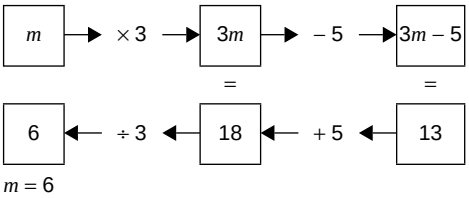
$y = 6$

c



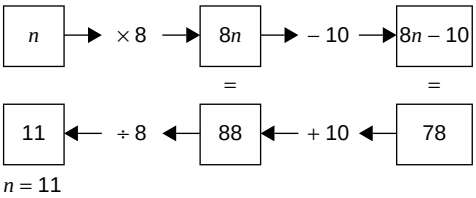
$a = 9$

d



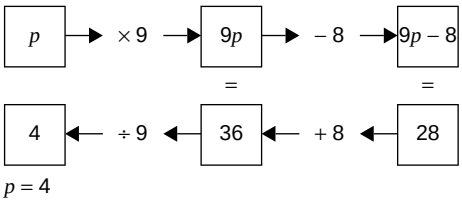
$m = 6$

e



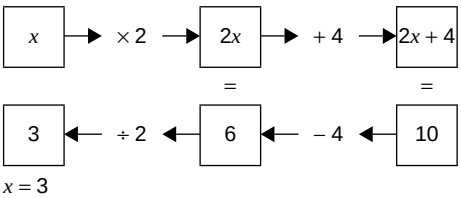
$n = 11$

f



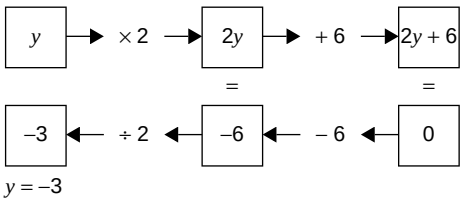
$p = 4$

g



$x = 3$

h



$y = -3$

i

a	$\times 6$	$6a$	$+5$	$6a+5$
=		=		=
2	$\div 6$	12	-5	17

$a = 2$

j

m	$\times 5$	$5m$	$+1$	$5m+1$
=		=		=
2	$\div 5$	10	-1	11

$m = 2$

k

n	$\times 2$	$2n$	-10	$2n-10$
=		=		=
11	$\div 2$	22	$+10$	12

$n = 11$

l

p	$\times 9$	$9p$	-2	$9p-2$
=		=		=
4	$\div 9$	36	$+2$	34

$p = 4$

m

x	$\times 2$	$2x$	$+5$	$2x+5$
=		=		=
1	$\div 2$	2	-5	7

$x = 1$

n

y	$\times 4$	$4y$	$+6$	$4y+6$
=		=		=
10	$\div 4$	40	-6	46

$y = 10$

o

a	$\times 7$	$7a$	$+4$	$7a+4$
=		=		=
5	$\div 7$	35	-4	39

$a = 5$

7 **a** $x = 4$ **b** $y = 48$ **c** $n = 4$
d $q = 7$ **e** $m = 7$ **f** $s = 9$

Exercise 1D

1 **a** $x = 12$ **b** $y = 11$ **c** $m = 22$ **d** $n = 25$
e $p = 23$ **f** $p = 3\frac{3}{4}$ **g** $q = 2{\cdot}25$ **h** $t = 5$

2 **a** $x = 3$ **b** $y = 12$ **c** $n = 5$ **d** $g = 11$
e $p = 4$ **f** $m = 12$ **g** $r = 2\frac{1}{2}$ **h** $s = 2\frac{1}{3}$
i $t = 1\frac{4}{7}$ **j** $z = 2\frac{1}{2}$ **k** $q = 5\frac{1}{2}$ **l** $h = 3\frac{2}{3}$
m $x = \frac{1}{2}$ **n** $y = \frac{2}{3}$ **o** $z = \frac{3}{4}$

3 **a** $x = 72$ **b** $a = 39$ **c** $b = 84$
d $p = 96$ **e** $q = 105$ **f** $r = 54$
g $m = 10$ **h** $n = 4{\cdot}5$ **i** $p = 11$

4 **a** $p = 3{\cdot}25$ **b** \$30·50 **5** \$11·55

6 **a** $x = 36$ **b** $x = 15$

Exercise 1E

1 **a** $x = 9$ **b** $y = 5$ **c** $m = 7$ **d** $n = 4$
e $q = 5$ **f** $a = 2$ **g** $b = 3$ **h** $c = 7$
i $x = 8$ **j** $r = \frac{1}{2}$ **k** $s = \frac{1}{2}$ **l** $m = 2\frac{6}{7}$

2 **a** $x = 8$ **b** $y = 12$ **c** $y = 6$
d $a = 10$ **e** $b = 36$ **f** $c = 4$
g $m = 7\frac{1}{2}$ **h** $n = 2\frac{1}{2}$ **i** $p = 2\frac{2}{3}$

3 **a** $x = 12$ **b** $y = 21$ **c** $z = 28$
d $m = 16$ **e** $n = 24$ **f** $p = 72$
g $q = 2\frac{1}{2}$ **h** $r = 6$ **i** $s = 5$

4 **a** $x = 6$ **b** $a = 8$ **c** $n = 9$
d $n = 6$ **e** $p = 10$ **f** $q = 14$
g $m = 12$ **h** $z = 15$ **i** $t = 16$

5 **a** $x = 13$ **b** $x = 10$ **c** $y = 25$ **d** $y = 15$

6 The regular price for each ski pass is \$45
The students paid \$37·50 for each of their tickets

7 Each donut cost \$1·25

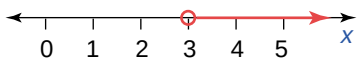
8 The standard price for the ski lodge is \$168

9 It will take 17 minutes for the queue to grow to 71 people

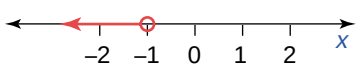
Exercise 1F

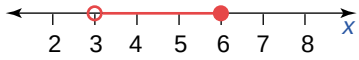
1 **a** $15 + 12 > 2 \times 5$ **b** $3 \times 6 < 40 \div 2$
c $4 + 8 = 6 \times 2$ **d** $16 - 5 > 24 \div 3$
e $4 \times 0{\cdot}5 = 20 \div 10$ **f** $36 + 27 > 6 \times 7$
g $9 \times 12 = 216 \div 2$ **h** $4^2 + 1 < 20 - 2$

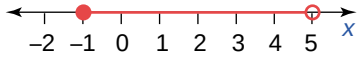
2 **a**



b

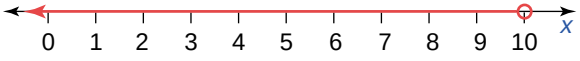


c 

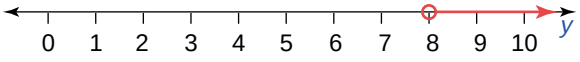
d 

3 a $x \geq 1$ b $x < 2$ c $-2 < x \leq 1$
d $0 \leq x \leq 3$ e $0 < x < 3$ f $-1 \geq x > 2$

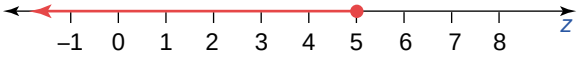
4 a $x < 10$



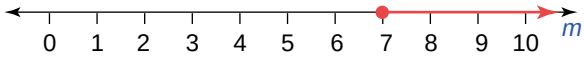
b $y > 8$



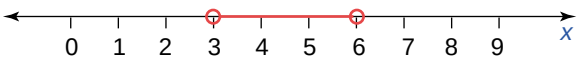
c $z \leq 5$



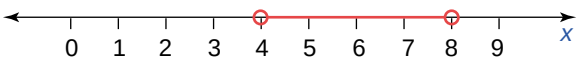
d $m \geq 7$



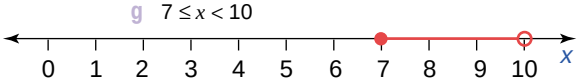
e $3 < x < 6$



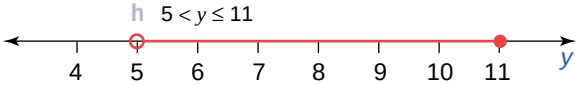
f $4 < x < 8$



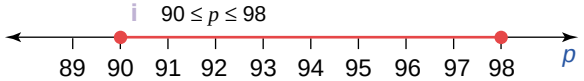
g $7 \leq x < 10$



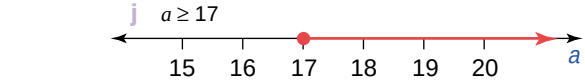
h $5 < y \leq 11$



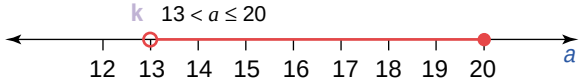
i $90 \leq p \leq 98$



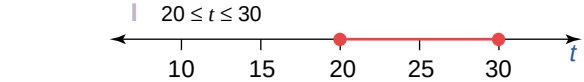
j $a \geq 17$



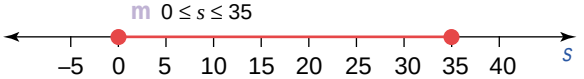
k $13 < a \leq 20$



l $20 \leq t \leq 30$

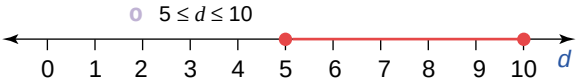


m $0 \leq s \leq 35$



n $0 < s \leq 50$

o $5 \leq d \leq 10$

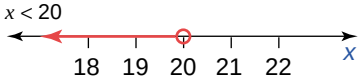


5 a $x < 4$ b $y > 18$ c $z \geq 31$ d $m \leq 5$
e $n < 2$ f $p \leq 20$ g $x \geq 5$ h $y > 6$
i $z < 5\frac{1}{2}$ j $m \leq 4$ k $p < 9$ l $q > 5\frac{1}{2}$
m $x \geq 35$ n $y \leq 52$ o $z > 60$ p $m < 24$
q $n \geq 18$ r $p < 24$ s $x \leq 18$ t $y > 16\frac{2}{3}$
u $z < 6$ v $a \leq 10$ w $b < 12$ x $c \geq 8$

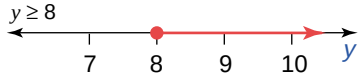
6 a $x \geq 1\frac{1}{2}$ b $y < 4$ c $z \leq 4$ d $a < 3\frac{1}{2}$
e $b \geq 1\frac{1}{2}$ f $c < 4\frac{3}{5}$ g $m \geq 21$ h $n < 66$
i $p \geq 75$ j $x < 4$ k $y \geq 80$ l $z \leq 90$
m $y \geq 80$ n $y > 15$ o $z < 9$ p $a \leq 5$
q $b < 12$ r $c \geq 16$

7 a $x > 6$

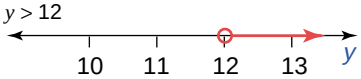
b $x < 20$



c $y \geq 8$



d $y > 12$

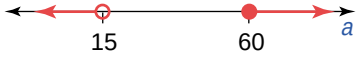


8 $b > 275$
The original balance was greater than $275.

9 $d < 5$
The amount d is less than $5

10 $5 < t \leq 25$

11 $15 < a \geq 60$



Applications and Activities

1 a $n = 6$ b $n = 4$ c $x = 9$
d $y = 4$ e $x = 7$ f $n = 3$

2 a $x = 6$ b $n = 7$ c $n = 2$
d $n = 3$ e $x = 1$ f $n = 2$

3 $n = 2$

4 a $n = 2$ b $n = 4$ c $n = 4$
d $n = 3$ e $n = 4$ f $n = 6$

5 a $x = 5$ b $x = 2$ c $n = 3$ d $x = 4$

Enrichment and Extension

1 a $x = 2$ b $y = 18$ c $m = 5$
d $n = 5$ e $p = 4$ f $q = 3$
g $n = 11$ h $p = 2$ i $q = 8$

2 a $x = 6$ b $y = 11$ c $z = 12$
d $a = 3$ e $b = 4$ f $c = 9 \div 3 = 3$
g $a = 3$ h $b = 7$ i $c = 3$

3 a $a = 4$ b $b = 4$ c $c = 5$
d $m = 3$ e $y = 4$ f $z = 2$
g $m = 5$ h $y = 3$ i $z = 10$

4 a $m = 3$ b $n = 9$ c $p = 4$
d $x = 4$ e $y = 3$ f $z = 6$

5 a $p = 2$ b $q = 3$ c $m = 5$
d $x = 2$ e $y = 3$ f $z = 10$

6 a $x = 6$ b $y = 0$ c $z = 2$

Revision Questions

1 a $x = 7$ b $y = 5$ c $z = 18$
d $m = 30$ e $q = 6$ f $p = 8$
g $m = 8$ h $n = 9$ i $p = 12$
j $q = 56$ k $r = 12$ l $s = 7$

2 a Correct b Correct

3 a $m = 5$ b $p = 20$ c $r = 6$
d $t = 21$ e $q = 4$ f $p = 8$

4 a $x = 9$ b $y = 35$ c $z = 8$
d $m = 5\frac{1}{2}$ e $m = 20$ f $n = 4$

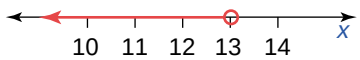
5 a $x = 8$ b $y = 4$ c $z = 9$ d $x = 10$
e $y = 9$ f $q = 8$ g $z = 6$ h $m = 10$
i $n = 16$ j $p = 10$ k $q = 10$ l $r = 14$

6 a $x = 8$ b $y = 8$ c $y = 18$ d $n = 10$

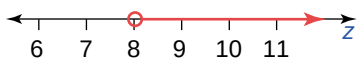
7 Each ice cream usually costs $4·50

8 a $16 + 13 > 4 \times 6$ b $4 \times 5 < 80 \div 2$
c $12 \times 6 = 144 \div 2$ d $5^2 - 4 < 6 \times 4$

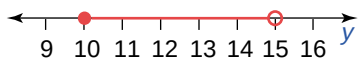
9 a



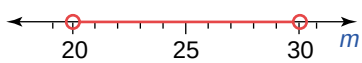
b



c



d

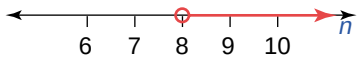


10 a $5 \le g \le 8$ b $60 < m \le 100$

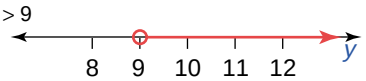
11 a $x < 3$ b $z \le 21$ c $z > 3$
d $m > 6$ e $p \ge 20$ f $q \le 44$
g $n \ge 8$ h $t \le 6$ i $s \ge 10$

12 a $x > 5$ b $y \le 3$ c $z \ge 20$
d $m > 24$ e $p < 10$ f $q \le 20$

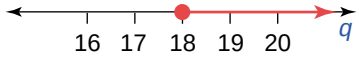
13 a $n > 8$



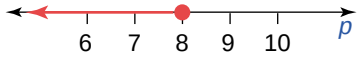
b $y > 9$



c $y \ge 18$



d $p \le 8$



14 $125 < 100 + d < 148$
$25 < d < 48$

Between $25 and $48 was added to bank account.