

Answers

Exercise 1.1

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|--------------------------|-----------------------|
| 1. (a) $(x - 2)(x - 4)$ | (b) $(x + 6)^2$ |
| 2. (a) $(2x - 3)(x + 2)$ | (b) $(2x + 3)^2$ |
| 3. (a) $(x + 1)(x - 9)$ | (b) $(x - 7)^2$ |
| 4. (a) $(2x + 1)(x + 1)$ | (b) $(4x - 1)^2$ |
| 5. (a) $(3x + 2)^2$ | (b) $(5x - 1)(x + 3)$ |

Exercise 1.2

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|-----------|--------|---------|
| 1. (a) 16 | (b) 49 | (c) 121 |
|-----------|--------|---------|

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|-----------------------|-------------------|----------------------|
| 2. (a) x^2 | (b) x^2 | (c) $48x$ |
| 3. (a) $28x$ | (b) x | (c) 1 |
| 4. (a) $\frac{1}{8}x$ | (b) 9 | (c) $\pm 4xy$ |
| 5. (a) $9b^2$ | (b) $2(x-1)(y-1)$ | (c) $25a^2$ |
| 6. (a) $36x^2$ | (b) $4x^2$ | (c) $\frac{1}{4}K^2$ |
| 7. (a) $25x^2$ | (b) $49x^2$ | |

Exercise 1.3

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|------------------------------|--------------------------|
| 1. (a) -2.414 or 0.414 | (b) 0.4385 or 4.5615 |
| (c) -5.450 or -0.550 | |
| 2. (a) 2.268 or 5.732 | (b) -1.193 or 4.193 |
| (c) 0.2762 or 21.72 | |
| 3. (a) -4.303 or -0.697 | (b) -2.783 or 10.78 |
| (c) -6.542 or -0.4585 | |
| 4. 0.3792 or 0.8792 | |
| 5. (a) -2.766 or 1.266 | (b) -2.808 or 0.4748 |
| (c) -3.621 or 0.6213 | |
| 6. (a) -1.580 or -0.3798 | (b) -1.554 or 0.8043 |
| (c) 0.3930 or -3.393 | |
| 7. (a) -0.5 or 1.333 | (b) -3 or -1.5 |
| (c) -2 or 1 | |
| 8. -5.742 or 1.742 | |

Exercise 1.4

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|------------------------------|--------------------------|
| 1. (a) -6.542 or -0.4585 | (b) 1 or 3 |
| (c) -4.766 or -0.7345 | |
| 2. (a) -0.8673 or 1.153 | (b) -0.4574 or 1.458 |
| (c) 0.2764 or 0.7236 | |

3. (a) -1 or $-\frac{3}{4}$ (b) $\frac{4}{3}$ (c). -1.379 or -0.1209
 4. -1.264 or 0.2638

Exercise 1.5

1. (a) -2 or 3 (b) $-\frac{3}{2}$ or $-\frac{1}{3}$ (c) $\frac{-3}{2}$ or $\frac{-2}{3}$
 (d) 0 or $\frac{-1}{2}$ (e) -0.1761 or 5.676 (f) $\frac{-2}{5}$ or $\frac{2}{5}$
 (g) 0 or $\frac{-1}{8}$ (h) 0.634 or 2.366 (i) -1 or $\frac{5}{3}$
 (j) 0.5538 or 14.45 (k) $\frac{-2}{5}$ or $\frac{1}{2}$ (l) -1 or $\frac{5}{3}$
 (m) -0.1629 or 0.8771 (n) -1 or 6
 (p) -0.449 or 4.449 (q) -0.3891 or 2.056
 (r) -1.652 or 0.652
 2. 50 cm^2 3. 12
 4. (a) 20 cm or 10 cm (b) 15 cm or 30 cm
 5. $2x^2 - 9x - 5 = 0$,
 Area = 84 cm^2
 6. 6 km/h , 3 h
 7. 4 m , 48 m^2 8. 34

Exercise 1.6

1. Table 1.2 (a) $y = x^2 - 2x - 8$

x	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7
x^2	25	16	9	4	1	0	1	4	9	16	25	36	49
$-2x$	10	8	6	4	2	0	-2	-4	-6	-8	-10	-12	-14
-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8
$y = x^2 - 2x - 8$	27	16	7	0	-5	-8	-9	-8	-5	0	7	16	27
x	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8
2x	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14

$-x^2$	-25	-16	-9	-4	-1	0	-1	-4	-9	-16	-25	-36	-49
$y = 8 + 2x - x^2$	-27	-16	-7	0	5	8	9	8	5	0	-7	-16	-27

Equations of lines of symmetry; $x = 1$ and $y = 0$

2. *Line of symmetry* *Maximum/minimum points*
- (a) $x = -1$ minimum value -4
- (b) $x = -3$ minimum value 0
- (c) $x = 2\frac{1}{2}$ minimum value $\frac{3}{4}$
- (d) $x = -2$ maximum value 16
- (e) $x = 1$ maximum value -4
3. (a) Minimum points; (i) 0 (ii) 10 (iii) -10
- (b) $y = x^2$ onto $y = x^2 + 10$; a translation of vector $\begin{pmatrix} 0 \\ 10 \end{pmatrix}$
- $y = x^2$ onto $y = x^2 - 10$; a translation of vector $\begin{pmatrix} 0 \\ -10 \end{pmatrix}$
- (c) a translation of vector $\begin{pmatrix} 0 \\ -20 \end{pmatrix}$

4.

x	-3	-2	-1	0	1	2	3	4	5	6	7
y	-41	-29	-19	-11	-5	-1	1	1	-1	-5	-11

Lines of symmetry; $x = 3\frac{1}{2}$ or $y = 0$

5. Table 1.3

y	-4	-3	-2	-1	0	1	2	3	4
x	4	$\frac{9}{4}$	1	$\frac{1}{4}$	0	$\frac{1}{4}$	1	$\frac{9}{4}$	4

Exercise 1.7

1. For all values of x from the learner's graph, allow a deviation of ± 0.1 from the given values.
- (a) 0.3 or 1.7 (b) No real roots
- (c) No real roots (d) -2
- (e) -4.2 or 1.2 (f) No real roots

Exercise 1.8

For all values of x from the learner's graph, allow a deviation of ± 0.1 from the stated values.

1. (a) -3.8 or 1.8 for x
 -2.8 or 2.8 for y
 (c) -3.1 or 1.1 for x
 5.1 or 0.9 for y
 (e) 5.4 or 0.6 for x
 8.2 or 1.8 for y
- (b) -2.0 or 0 for x
 -3.0 or 1 for y
 (d) -1.4 or 1.7 for x
 6.1 or -3.1 for y
2. (a) $y = x^2$ and $y = 3x - 2$; $x = 1.0$ or 2.0
 (b) $y = 3x^2$ and $y = 7x - 4$; $x = 1.0$ or 1.3
 (c) $y = x^2$ and $y = 6x + 8$; $x = -1.1$ or 7.1
 (d) $y = 2x^2$ and $y = 7x + 8$; $x = -0.9$ or 4.4
 (e) $y = x^2$ and $y = 22x + 6$; $x = 0.3$ or 21.7
 (f) $y = x^2$ and $y = -7x - 3$; $x = -6.5$ or -0.5

Exercise 1.9

1. *Equation of line* *Solution*
 (a) $y = 0$ $x = -5.4$ or 0.4
 (b) $y = 2$ $x = -4.5$ or -0.5
 (c) $y = x + 1$ $x = -3$ or -1
2. *Equation of line* *Solution*
 (a) $y = 0$ $x = -1$ or 0.5
 (b) $y = -1$ $x = -0.5$ or 0
 (c) $y = x + 4$ $x = 1.6$ or -1.6
3. *Equation of line* *Solution*
 (a) $y = 0$ $x = -0.6$ or 6.8
 (b) $y = 2x + 4$ $x = 0$ or 4
 (c) $y = \frac{4}{3}x + 5$ $x = 0.2$ or 4.4
4. *Equation of line* *Solution*
 (a) $y = 0$ $x = -0.9$ or 2.2
 (b) $y = 2$ $x = -1.9$ or 3.2
 (c) $y = \frac{-x}{3} + 1$ $x = -1.7$ or 2.4
5. *Equation of line* *Solution*
 (a) $y = 0$ $x = -4$ or 1.5
 (b) $y = 3x$ $x = -3$ or 2
 (c) $y = \frac{x}{3} - 10$ $x = -2.7$ or 0.4