

Basic algebra answers

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1 a $x - 2$

b $2x$

c $2x - 4$ or $2(x - 2)$

d $x + x - 2 + 2x + 2x - 4$ (1 mark) = $6x - 6$

2 a $3y \times y = 3y^2$, $2y + y = 3y$, $3(y + 1) = 3y + 3$

3 b i $3q$

ii $15pq$

iii $9x - 4$

Remember: Check which grade you are working at.

Expanding and factorising answers

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1 a $5x - 15$

b $8x + 6$

c $2(2x + 3) + 2(x + 3)$ (1 mark) = $6x + 12$

2 a $3x - 12 + 8x + 2$ (1 mark) = $11x - 10$

b i $2(2x + 3)$

ii $x(5x + 2)$

3 a i $5x^2 - 11xy$

ii $10x - 12y$

b i $3xy(y + 2x)$

ii $2ab(2b - 4a + ab)$

c $3pq(pq + 2)$

Remember: Check which grade you are working at.

Quadratic expansion and substitution answers

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- 1 a** $3x + 6$
- b** $x^2 + 2x$
- c** $x^2 - 3x + 2x - 6$ (1 mark) = $x^2 - x - 6$ (1 mark)
- d** $(x + 2)(x + 1)$ (1 mark) = $x^2 + 3x + 2$
- 2 a** $x^2 - 4x + x - 4$ (1 mark) = $x^2 - 3x - 4$ (1 mark)
- b** $(x + 4)(x + 4)$ (1 mark) = $x^2 + 8x + 16$
- 3 a** 4
- b** 52
- c i** $200f + 50e$
- ii** £10 000

Remember: Check which grade you are working at.

Linear equations answers

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- 1 a** $\frac{x}{3} = -1$ (1 mark); $x = -3$ (1 mark)
b $3x = -3$ (1 mark); $x = -1$ (1 mark)
c $7x = 14$ (1 mark); $x = 2$ (1 mark)
- 2 a** $x = 1$ (1 mark for $2x - x = 6 - 5$)
b $y = 5\frac{1}{2}$ (1 mark for $3y - y = 5 + 6$)
- 3 a** 8
b Because $2(1\frac{1}{2} + 5) = 2 \times 6\frac{1}{2} = 13$

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- 1 a i** $3x + 5 = 26$
ii 7
- b i** $12y = 24$ (1 mark); $y = 2$ (1 mark)
ii $4x = 12$ (1 mark); $x = 3$ (1 mark)
- 2 a** $2x = 3$ (1 mark); $x = 1\frac{1}{2}$ (1 mark)
b $2x = -17$ (1 mark); $x = -8\frac{1}{2}$ (1 mark)
c $3x = 18$ (1 mark); $x = 6$ (1 mark)
- 3 a** $x = -3$ (1 mark for $3x = -9$)
b $x = -\frac{1}{8}$ (1 mark for $8x = -1$)

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- 1 a** $a = 4, b = 6, c = 7, d = 8$
b i $50x + 140$
ii $50x + 140 = 340$ (1 mark), $x = 4$
- 2** $x + 3x - 1 + 2x + 5 = 25$ (1 mark)
 $6x + 4 = 25$ (1 mark)
 $x = 3.5$ cm (1 mark)

Remember: Check which grade you are working at.

Trial and improvement answers

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1 1 mark for finding the answer is between 5.6 and 5.7

1 mark for testing 5.65

1 mark for $x = 5.7$

2 1 mark for testing 4 (8.5)

1 mark for finding the answer is between 3.7 and 3.8

1 mark for testing 3.75

1 mark for $x = 3.7$

Remember: Check which grade you are working at.

Formulae answers

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1 a $x + 6$

b $4x + 6$

c $4x + 6 = 27$ (1 mark); $x = 5\frac{1}{4}$

2 a It is true for all values

b As for **a**; it is true for all values

3 a $x = \frac{c}{\pi}$

b $3x = 6y + 9$ (1 mark); $x = 2y + 3$ (1 mark)

Remember: Check which grade you are working at.

Inequalities answers

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1 a $x \leq 2$

b $x > -2$

c $-1, 0, 1, 2$

2 a $-3 < x \leq 1$

b i $\frac{x}{2} > -2$ (1 mark); $x > -4$

ii $x + 3 \leq 2$ (1 mark); $x \leq -1$

c $-3, -2, -1$

Remember: Check which grade you are working at.

Graphs answers

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1 a 3 miles

b 13 km

c 100 miles

2 a i 2 km

ii 5 minutes

b i 40 minutes

ii $7\frac{1}{2}$ km/h

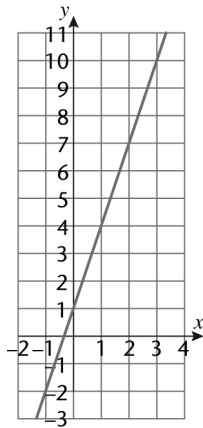
Remember: Check which grade you are working at.

Linear graphs answers

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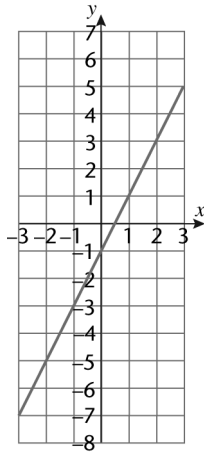
1 a 1; 4; 7

b



c 2.3

2



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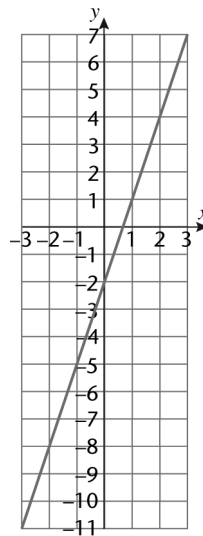
1 a D

b C

c D and E

d $3; \frac{1}{2}; -\frac{5}{3}$

2 Graph of $y = 3x - 2$;
intercepting y -axis at -2 (1 mark);
gradient 3 (1 mark)



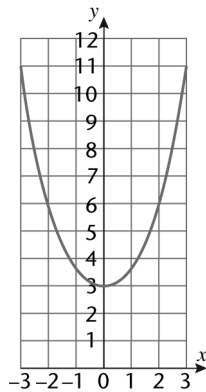
Remember: Check which grade you are working at.

Quadratic graphs answers

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1 a 4, 3, 4, 7

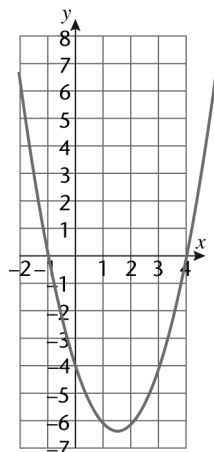
b Graph of $y = x^2 + 3$



(1 mark for five correct points)

2 a -4, -6, -4

b Graph of $y = x^2 - 3x - 4$

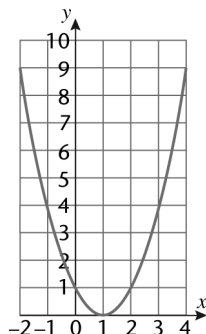


(1 mark for five correct points)

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1 a 0, 1, 4, 9

b Graph of $y = x^2 - 2x + 1$



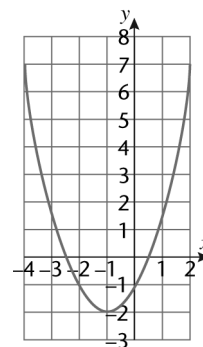
(1 mark for five correct points)

c -1.45, 3.45

d 1

2 a 7, -2, -1, 2

b Graph of $y = x^2 + 2x - 1$



(1 mark for five correct points)

c -2.9, 0.9

d -2.4, 0.4

Remember: Check which grade you are working at.

Pattern answers

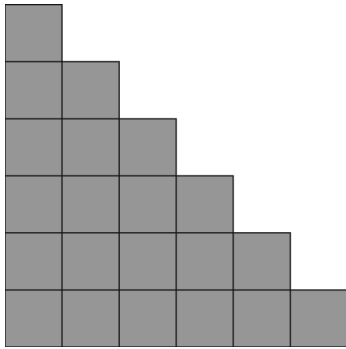
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1 a $1 + 3 + 5 + 7 = 16 = 4^2$; $1 + 3 + 5 + 7 + 9 = 25 = 5^2$

b 99

c 225

2 a



b 6, 10, 15

c The number added goes up by 1 more each time

Remember: Check which grade you are working at.

The n th term answers

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1 a 5, 9, 13

b 7^{th}

c The terms are all odd numbers, 84 is not odd

d $7n - 4$ (1 mark each term)

2 a 16, 21, 26

b 101

c $5n + 1$ (1 mark each term)

Remember: Check which grade you are working at.

Sequences answers

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- 1 a** Always odd
b Always even
c Could be either
d Always odd
e Always odd
- 2 a** $2 \times$ anything is even
b $2n \times 2n = 4n^2$ (1 mark); which is a multiple of 4 (1 mark)
- 3 a** 18, 24, 30, 36
b $6n + 6$ or $6(n + 1)$ (1 mark each term or factor)

Remember: Check which grade you are working at.