



# Answers

Calculator

KS4

Mastery:  
Foundation  
Booklet

# 2

# Calculator

## KS4 Mastery:

## Foundation Booklet 2 **Answers**

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## Week 1

1. Work out the 15th term in the sequence whose  $n^{\text{th}}$  term is  $4n + 7$

$$4 \times 15 + 7 = 67$$

2. Find the cube root of 6859.

**19**

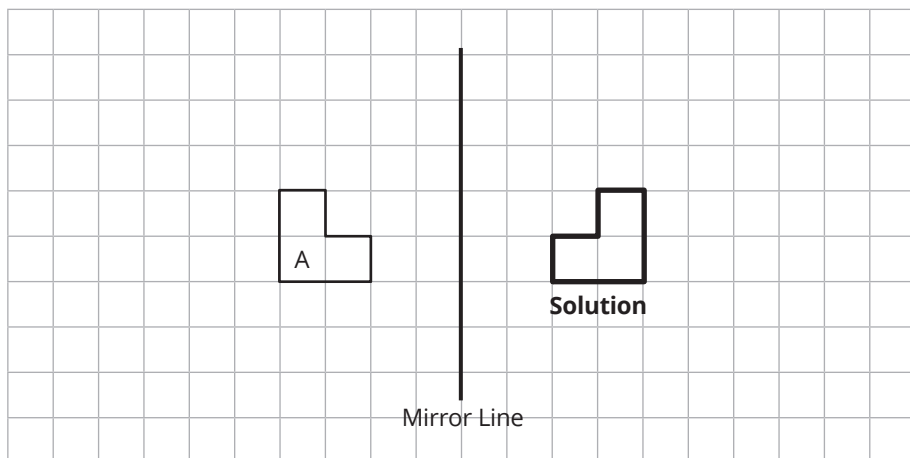
3. Round 17.2 correct to the nearest whole number.

**17**

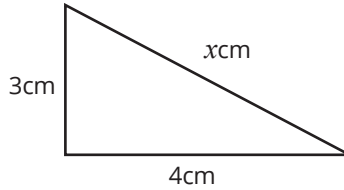
4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 20 + 30d$ . Work out the cost of hiring the van for 8 days.

$$C = 20 + 30 \times 8 = \text{£}260$$

5. Reflect shape A in the mirror line.



6. Find the missing length in the right-angled triangle.



**5cm**

7. Find the mean of the following list of numbers:

1, 3, 3, 6, 7

$$\mathbf{20 \div 5 = 4}$$

8. Ella changed £100 into euros. The exchange rate was £1:€1.05. How many euros did she get?

$$\mathbf{100 \times 1.05 = \text{€}105}$$

9. Find 15% of £80.

$$\mathbf{0.15 \times 80 = \text{£}12}$$

10. A number,  $x$ , rounded to the nearest whole number, is 7. Write down the error interval for  $x$ .

$$\mathbf{6.5 \leq x < 7.5}$$

11. 80 students were asked what their favourite subject is.  $\frac{2}{5}$  of the students said their favourite subject is maths. How many students said their favourite subject is maths?

$$\frac{2}{5} \text{ of } 80 = 32$$

12. Does the line  $y = 2x$  pass through the point (4, 8)?

$$8 = 2 \times 4, \text{ yes.}$$

13. Find the highest common factor of 15 and 20.

**5**

14. Work out  $(2 \times 10^3) \times (3 \times 10^5)$ . Give your answer in standard form.

$$6 \times 10^8$$

15. Factorise  $x^2 + 4x + 3$

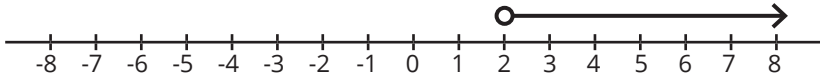
$$(x + 3)(x + 1)$$

16. Two different types of washing powder are on sale. Brand A has a mass of 500g and costs £3.70. Brand B has a mass of 1kg and costs £7.25. Which brand offers better value for money?

$$3.70 \times 2 = \text{£}7.40$$

**Brand B offers better value for money. (Or any other suitable method.)**

17. Represent the inequality  $x > 2$  on the number line.



18. Change 4cm to mm.

$$4 \times 10 = 40\text{mm}$$

19. Find the area of a circle whose radius is 5cm.

$$\pi \times 5^2 = 25\pi = 78.5\text{cm}^2 \text{ (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are 4, 6, 8, 10.

$$2n + 2$$

## Week 2

1. Work out the 8th term in the sequence whose  $n^{\text{th}}$  term is  $2n - 10$

$$2 \times 8 - 10 = 6$$

2. Find the square root of 3844.

$$62$$

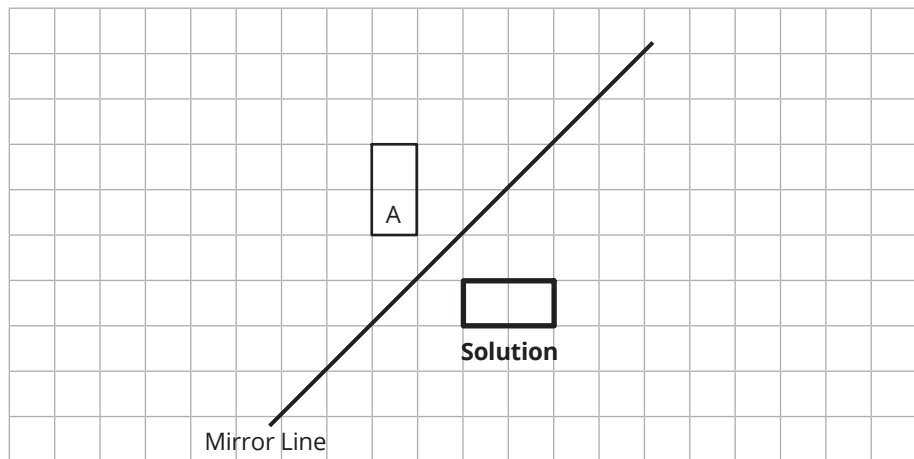
3. Round 3.782 to 1 decimal place.

$$3.8$$

4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 10 + 45d$ . Work out the cost of hiring the van for 5 days.

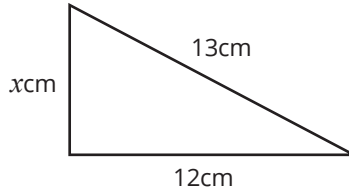
$$C = 10 + 45 \times 5 = \text{£}235$$

5. Reflect shape A in the mirror line.





6. Find the missing length in the right-angled triangle.



**5cm**

7. Find the mean of the following list of numbers:

2, 5, 6, 3, 8, 1, 3

$$\mathbf{28 \div 7 = 4}$$

8. Ella changed £40 into euros. The exchange rate was £1:€1.12. How many euros did she get?

$$\mathbf{40 \times 1.12 = \text{€}44.80}$$

9. Find 12% of £95.

$$\mathbf{0.12 \times 95 = \text{£}11.40}$$

10. A number,  $x$ , rounded to the nearest whole number, is 20. Write down the error interval for  $x$ .

$$\mathbf{19.5 \leq x < 20.5}$$

11. 120 students were asked what their favourite subject is.  $\frac{3}{4}$  of the students said their favourite subject is maths. How many students said their favourite subject is maths?

$$\frac{3}{4} \text{ of } 120 = 90$$

12. Does the line  $y = x + 5$  pass through the point (1, 3)?

$$3 \neq 1 + 5, \text{ no.}$$

13. Find the highest common factor of 40 and 110.

$$10$$

14. Work out  $(3.4 \times 10^2) \times (1.5 \times 10^3)$ . Give your answer in standard form.

$$5.1 \times 10^5$$

15. Factorise  $x^2 + 7x + 10$

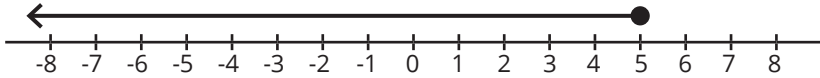
$$(x + 5)(x + 2)$$

16. Two different types of washing powder are on sale. Brand A has a mass of 200g and costs £1.25. Brand B has a mass of 1kg and costs £6.00. Which brand offers better value for money?

$$1.25 \times 5 = \text{£}6.25$$

**Brand B offers better value for money. (Or any other suitable method.)**

17. Represent the inequality  $x \leq 5$  on the number line.



18. Change 5kg to grams.

$$5 \times 1000 = 5000\text{g}$$

19. Find the area of a circle whose diameter is 8cm.

$$\pi \times 4^2 = 16\pi = 50.3\text{cm}^2 \text{ (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are 10, 14, 18, 22.

$$4n + 6$$

## Week 3

1. Work out the 15th term in the sequence whose  $n^{\text{th}}$  term is  $18 - n$

$$18 - 15 = 3$$

2. Find the cube root of 531.441.

$$8.1$$

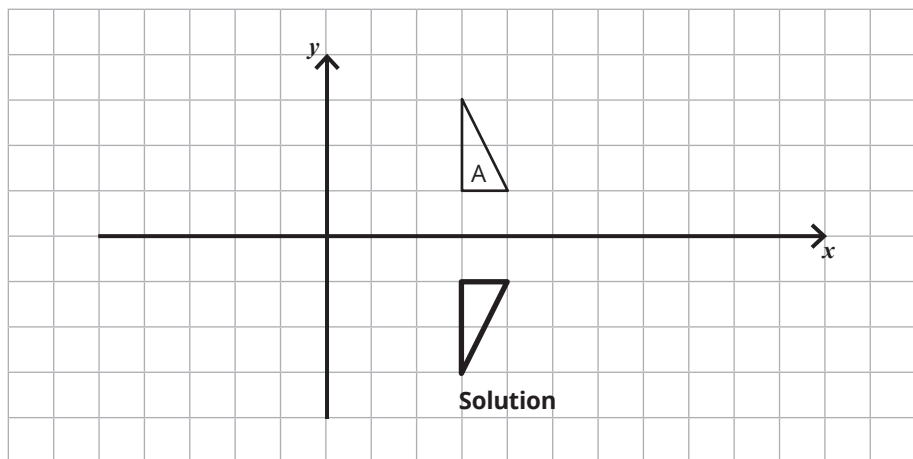
3. Round 18.231 to 2 decimal places.

$$18.23$$

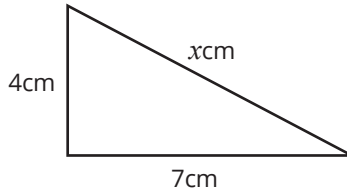
4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 15 + 18d$ . Work out the cost of hiring the van for 4.5 days.

$$C = 15 + 18 \times 4.5 = \text{£}96$$

5. Reflect shape A in the  $x$ -axis.



6. Find the missing length in the right-angled triangle.



$$x = \sqrt{7^2 + 4^2} = 8.1\text{cm (1d.p.)}$$

7. Find the mean of the following list of numbers:

3.5, 1.2, 4.7, 5.5, 9.3

$$24.2 \div 5 = 4.84$$

8. Ella changed £90 into euros. The exchange rate was £1:€0.97. How many euros did she get?

$$90 \times 0.97 = \text{€}87.30$$

9. Find 2.5% of £110.

$$0.025 \times 110 = \text{£}2.75$$

10. A number,  $x$ , rounded to one decimal place, is 4.7. Write down the error interval for  $x$ .

$$4.65 \leq x < 4.75$$

11. 120 students were asked what their favourite subject is.  $\frac{1}{10}$  of the students said their favourite subject is maths. How many students said their favourite subject is **not** maths?

$$\frac{9}{10} \text{ of } 120 = 108$$

12. Does the line  $y = 3x + 1$  pass through the point (4, 15)?

$$15 \neq 3 \times 4 + 1, \text{ no.}$$

13. Find the highest common factor of 100 and 180.

$$20$$

14. Work out  $(2.03 \times 10^{-2}) \times (4.7 \times 10^4)$ . Give your answer in standard form.

$$9.541 \times 10^2$$

15. Factorise  $x^2 + 2x - 15$

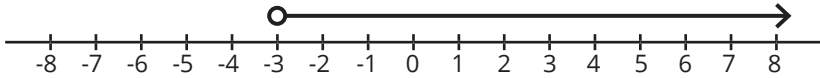
$$(x + 5)(x - 3)$$

16. Two different types of washing powder are on sale. Brand A has a mass of 200g and costs £1.20. Brand B has a mass of 500g and costs £3.80. Which brand offers better value for money?

$$1.20 \times 2.5 = \text{£}3.00$$

**Brand A offers better value for money. (Or any other suitable method.)**

17. Represent the inequality  $x > -3$  on the number line.



18. Change 9mm to cm.

$$9 \div 10 = 0.9\text{cm}$$

19. Find the circumference of a circle whose diameter is 10cm.

$$\pi \times 10 = 10\pi = 31.4\text{cm}^2 \text{ (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are 1, 6, 11, 16.

$$5n - 4$$

## Week 4

1. Work out the 20th term in the sequence whose  $n^{\text{th}}$  term is  $n^2$

$$20^2 = 400$$

2. Evaluate  $\sqrt[4]{2401}$ .

7

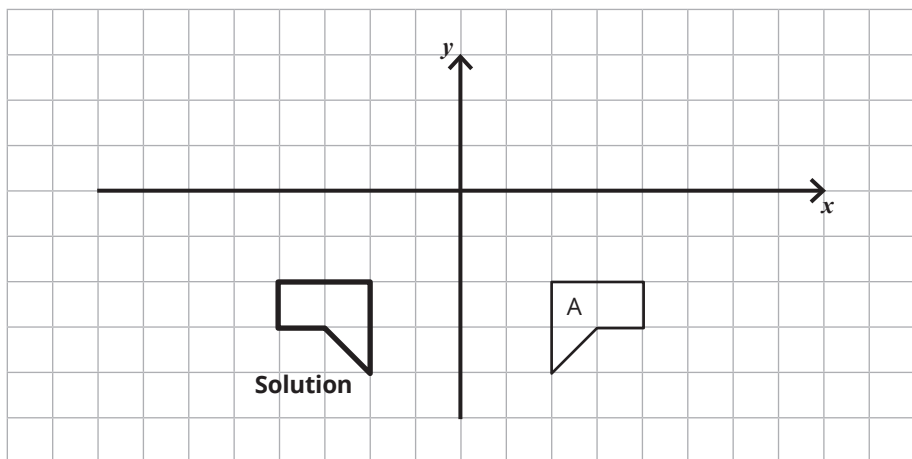
3. Round 4.1992 to 2 decimal places.

4.20

4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 110 + 12d$ . Work out the cost of hiring the van for two weeks.

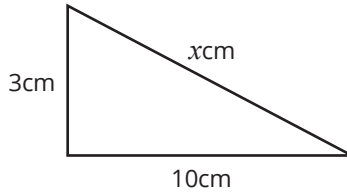
$$C = 110 + 12 \times 14 = \text{£}278$$

5. Reflect shape A in the  $y$ -axis.





6. Find the missing length in the right-angled triangle.



$$x = \sqrt{10^2 + 3^2} = 10.4\text{cm (1d.p.)}$$

7. Find the mean of the following list of numbers:

-1, -6, 4, 3

$$0 \div 4 = 0$$

8. Ella changed €100 into pounds. The exchange rate was £1:€1.15. How much did she get?

$$100 \div 1.15 = \text{€}86.96$$

9. Find 0.5% of £20.

$$0.005 \times 20 = \text{£}0.10$$

10. A number,  $x$ , rounded to one decimal place, is 9.0. Write down the error interval for  $x$ .

$$8.95 \leq x < 9.05$$

11. 180 students were asked what their favourite subject is.  $\frac{2}{3}$  of the students said their favourite subject is maths. How many students said their favourite subject is not maths?

$$\frac{1}{3} \text{ of } 180 = 60$$

12. Does the line  $y = 2x - 3$  pass through the point (7, 11)?

$$11 = 2 \times 7 - 3, \text{ yes.}$$

13. Find the lowest common multiple of 15 and 20.

$$60$$

14. Work out  $(6 \times 10^5) \times (3 \times 10^4)$ . Give your answer in standard form.

$$18 \times 10^9 = 1.8 \times 10^{10}$$

15. Factorise  $x^2 - x - 20$

$$(x - 5)(x + 4)$$

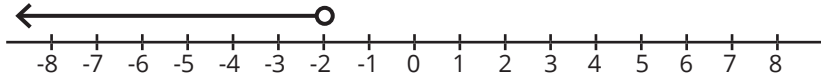
16. Two different types of washing powder are on sale. Brand A has a mass of 400g and costs £3.00. Brand B has a mass of 500g and costs £3.60. Which brand offers better value for money?

$$3 \times 5 = \text{£}15$$

$$3.6 \times 4 = \text{£}14.40$$

**Brand B offers better value for money. (Or any other suitable method.)**

17. Represent the inequality  $x < -2$  on the number line.



18. Change 18cm to m.

$$18 \div 100 = 0.18\text{m}$$

19. Find the circumference of a circle whose radius is 4cm.

$$\pi \times 8 = 8\pi = 25.1\text{cm (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are -2, 1, 4, 7.

$$3n - 5$$

## Week 5

1. Work out the 7th term in the sequence whose  $n^{\text{th}}$  term is  $8 - n^2$

$$8 - 7^2 = -41$$

2. Evaluate  $(\sqrt[3]{343})^2$ .

$$49$$

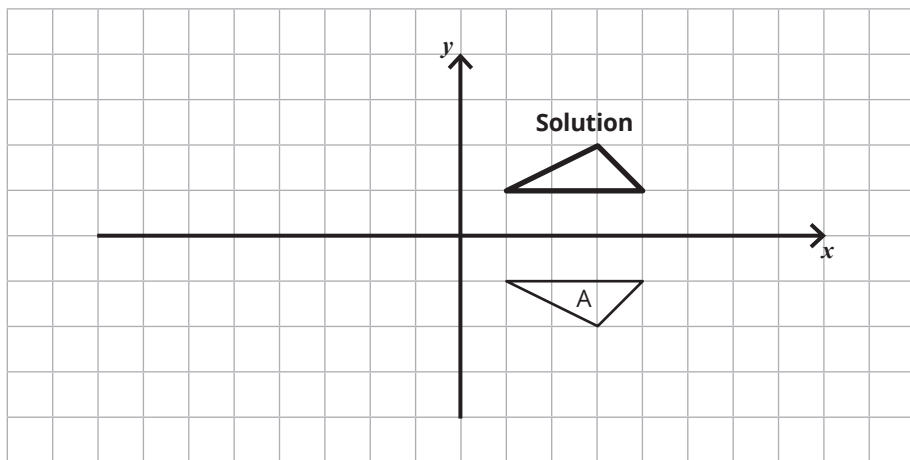
3. Round 241 to 1 significant figure.

$$200$$

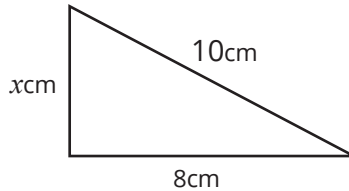
4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 8d$ . Work out the number of days hire that results in a cost of £56.

$$56 \div 8 = 7 \text{ days}$$

5. Reflect shape A in the  $x$ -axis.



6. Find the missing length in the right-angled triangle.



$$x = \sqrt{10^2 - 8^2} = 6\text{cm}$$

7. Find the mean of the following list of numbers:

2.1, 3.7, 4.05, 1.99, 2.8

$$4.64 \div 5 = 2.928$$

8. Ella changed €80 into pounds. The exchange rate was £1:€1.20. How much did she get?

$$80 \div 1.20 = \text{€}66.67 \text{ (2d.p.)}$$

9. Increase £90 by 8%.

$$90 \times 1.08 = \text{£}97.20$$

10. A number,  $x$ , rounded to two decimal places, is 0.74. Write down the error interval for  $x$ .

$$0.735 \leq x < 0.745$$

11. 240 students were asked what their favourite subject is.  $\frac{1}{5}$  of the students said their favourite subject is maths and  $\frac{1}{3}$  of the students said their favourite subject is English. The rest said their favourite subject is French. How many students said their favourite subject is French?

$$\frac{1}{5} \text{ of } 240 = 48$$

$$\frac{1}{3} \text{ of } 240 = 80$$

$$240 - (48 + 80) = 112$$

12. Does the curve  $y = x^2$  pass through the point (1, 4)?

$$4 \neq 1^2, \text{ no.}$$

13. Find the lowest common multiple of 45 and 70.

$$630$$

14. Work out  $(2 \times 10^3) \div (4 \times 10^5)$ . Give your answer in standard form.

$$0.5 \times 10^{-2} = 5 \times 10^{-3}$$

15. Factorise  $x^2 - 16$

$$(x - 4)(x + 4)$$

16. Three different types of washing powder are on sale. Brand A has a mass of 250g and costs £2.00. Brand B has a mass of 600g and costs £4.80. Brand C has a mass of 1kg and costs £7.50. Which brand offers better value for money?

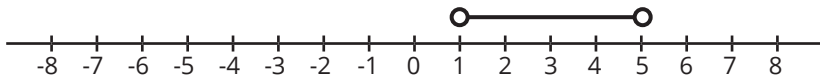
$$2.00 \div 250 = \text{£}0.008$$

$$4.80 \div 600 = \text{£}0.008$$

$$7.50 \div 1000 = \text{£}0.0075$$

**Brand C offers better value for money. (Or any other suitable method.)**

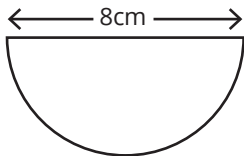
17. Represent the inequality  $1 < x < 5$  on the number line.



18. Change 0.4m to mm.

$$0.4 \times 100 \times 10 = 400\text{mm}$$

19. Find the area of the semi-circle shown.



$$\pi \times 4^2 \div 2 = 8\pi = 25.1\text{cm}^2 \text{ (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are 0.1, 0.2, 0.3, 0.4.

$$0.1n$$

## Week 6

1. Work out the 5th term in the sequence whose  $n^{\text{th}}$  term is  $4 - 0.1n^2$

$$4 - 0.1 \times 5^2 = 1.5$$

2. Evaluate  $(\sqrt{169})^3$ .

$$2197$$

3. Round 7564 to 1 significant figure.

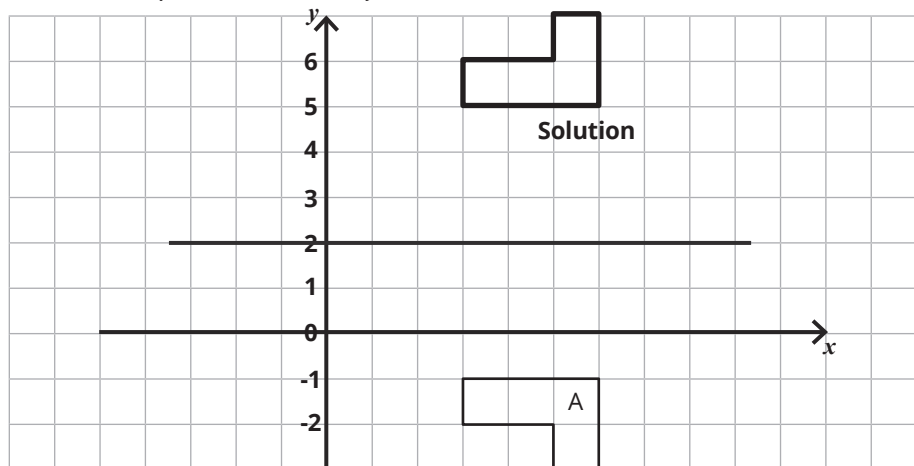
$$8000$$

4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 2d + 45$ . Work out the number of days hire that results in a cost of £83.

$$83 - 45 = 38$$

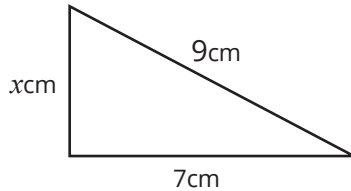
$$38 \div 2 = 19 \text{ days}$$

5. Reflect shape A in the line  $y = 2$ .





6. Find the missing length in the right-angled triangle.



$$x = \sqrt{9^2 - 7^2} = 5.66\text{cm (2d.p.)}$$

7. Find the mean of the following list of numbers:

-0.3, -1, -7, -2, -9, 17, 12

$$9.7 \div 7 = 1.39 \text{ (2d.p.)}$$

8. Ella changed £100 into euros. She spent €45 and then changed the rest back into pounds. The exchange rate, each time, was £1:€1.20. How many pounds does she now have?

$$100 \times 1.20 = \text{€}120$$

$$120 - 45 = \text{€}75$$

$$75 \div 1.20 = \text{£}62.50$$

9. Increase £72 by 100%.

$$72 \times 2 = \text{£}144$$

10. A number,  $x$ , rounded to one significant figure, is 9. Write down the error interval for  $x$ .

$$8.5 \leq x < 9.5$$

11. In a school,  $\frac{1}{5}$  of the students said that their favourite subject is English. There were 40 students who said that their favourite subject is English. How many students were in the school altogether?

$$40 \times 5 = 200$$

12. Does the curve  $y = x^2$  pass through the point (3, 9)?

$$9 = 3^2, \text{ yes.}$$

13. Find the lowest common multiple of 10, 12 and 20.

$$60$$

14. Work out  $(5 \times 10^3) \div (8 \times 10^{-3})$ . Give your answer in standard form.

$$0.625 \times 10^6 = 6.25 \times 10^5$$

15. Factorise  $x^2 - 49$

$$(x - 7)(x + 7)$$

16. Three different types of washing powder are on sale. Brand A has a mass of 100g and costs £1.20. Brand B has a mass of 320g and costs £3.50. Brand C has a mass of 1.5kg and costs £16. Which brand offers better value for money?

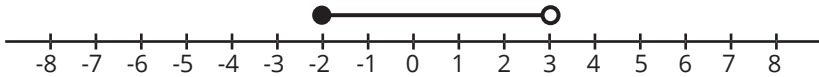
$$1.20 \div 100 = \text{£}0.012$$

$$3.50 \div 320 = \text{£}0.0109$$

$$16.00 \div 1500 = \text{£}0.01067$$

**Brand C offers better value for money. (Or any other suitable method.)**

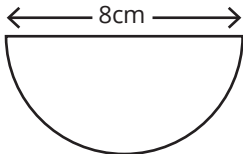
17. Represent the inequality  $-2 \leq x < 3$  on the number line.



18. Change  $8\text{cm}^2$  to  $\text{mm}^2$ .

$$8 \times 10^2 = 800\text{mm}^2$$

19. Find the perimeter of the semi-circle shown.



$$\pi \times 8 \div 2 = 4\pi$$

$$4\pi + 8 = 20.6\text{cm (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are 20, 17, 14, 11.

$$-3n + 23 \text{ or } 23 - 3n$$

## Week 7

1. Work out the first three terms in the sequence whose  $n^{\text{th}}$  term is

$$3 - \frac{1}{2}n$$

$$3 - \frac{1}{2} \times 1 = 2.5$$

$$3 - \frac{1}{2} \times 2 = 2$$

$$3 - \frac{1}{2} \times 3 = 1.5$$

2. Evaluate  $\frac{12^2}{\sqrt{25}}$ .

**28.8**

3. Round 0.03297 to 2 significant figures.

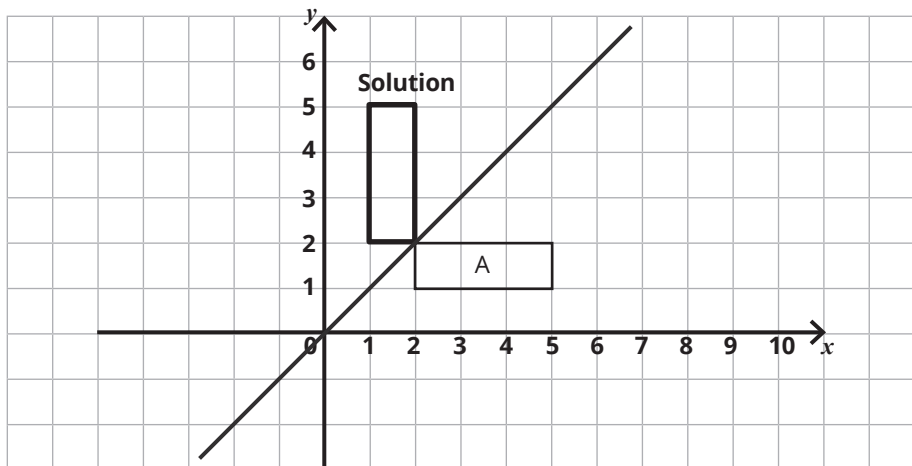
**0.033**

4. The cost,  $C$ , in pounds of hiring a van for  $d$  days is given by the formula  $C = 8.5d - 12$ . Work out the number of days hire that results in a cost of £39.

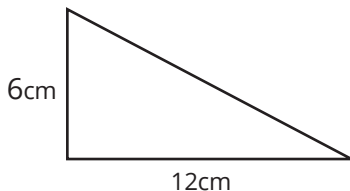
$$39 + 12 = 51$$

$$51 \div 8.5 = 6 \text{ days}$$

5. Reflect shape A in the line  $y = x$ .



6. Find the perimeter of the right-angled triangle.



$$x = \sqrt{12^2 + 6^2} = 13.416\dots\text{cm}$$

$$13.416\dots + 12 + 6 = 31.42\text{cm (2d.p.)}$$

7. The mean of this list of numbers is 7.2. Work out the value of  $x$ .

$$6, x, 9, 8, 4$$

$$7.2 \times 5 = 36$$

$$36 - (6 + 9 + 8 + 4) = 9$$

8. Ella changed £250 into euros. She spent €125 and then changed the rest back into pounds. The exchange rate was £1:€1.10. How many pounds does she now have?

$$250 \times 1.10 = \text{€}275$$

$$275 - 125 = \text{€}150$$

$$150 \div 1.10 = \text{£}136.36 \text{ (2d.p.)}$$

9. Increase £19 by 250%.

$$19 \times 3.5 = \text{£}66.50$$

10. A number,  $x$ , rounded to two significant figure, is 370. Write down the error interval for  $x$ .

$$365 \leq x < 375$$

11. In a school,  $\frac{2}{3}$  of the students said that their favourite subject is English. There were 100 students who said that their favourite subject is English. How many students were in the school altogether?

$$100 \div 2 \times 3 = 150$$

12. Does the curve  $y = x^2 + 5x$  pass through the point (2, 14)?

$$14 = 2^2 + 5 \times 2, \text{ yes.}$$

13. Find the lowest common multiple of 18, 24 and 40.

$$360$$

14. Work out  $(4 \times 10^{-5})^2$ . Give your answer in standard form.

$$16 \times 10^{-10} = 1.6 \times 10^{-9}$$

15. Factorise  $4x^2 - 25$

$$(2x - 5)(2x + 5)$$

16. Three different types of washing powder are on sale. Brand A has a mass of 0.1kg and costs £1.80. Brand B has a mass of 450g and costs £7.20. Brand C has a mass of 1.5kg and costs £30. Which brand offers better value for money?

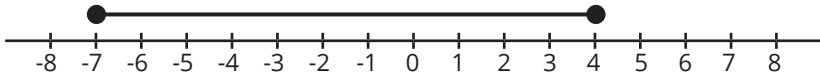
$$1.80 \div 100 = \text{£}0.018$$

$$7.20 \div 450 = \text{£}0.016$$

$$30.00 \div 1500 = \text{£}0.02$$

**Brand B offers better value for money.  
(Or any other suitable method.)**

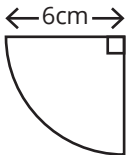
17. Represent the inequality  $-7 \leq x \leq 4$  on the number line.



18. Change  $1.5\text{m}^2$  to  $\text{cm}^2$ .

$$1.5 \times 100^2 = 15\,000\text{cm}^2$$

19. Find the perimeter of the shape shown.



$$\pi \times 12 \div 4 = 3\pi$$

$$3\pi + 6 + 6 = 21.4\text{cm (1d.p.)}$$

20. Find the  $n^{\text{th}}$  term of the sequence whose first four terms are 28, 21, 14, 7.

$$-7n + 35 \text{ or } 35 - 7n$$

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