

|                |  |
|----------------|--|
| <b>Name</b>    |  |
| <b>Form</b>    |  |
| <b>Teacher</b> |  |

# Maths Homework Booklet

## Year 9s Autumn

| <b>Topic Title</b>   | <b>Hand in by</b> | <b>Score</b> |
|--|-------------------|--------------|
| Straight line graphs – equations of the form $x=a$ , $y=a$ , $y=x$ |                   |              |
| Drawing Straight line graphs                                       |                   |              |
| Hegarty 56 – collecting like terms                                 |                   |              |
| Hegarty 160 – Expand a single bracket                              |                   |              |
| Check it – Simplify and expand                                     |                   |              |
| Solving equations  |                   |              |
| Factors and Multiples Revision                                     |                   |              |
| Common Factors   |                   |              |
| Hegarty 34 – Lowest Common Multiple                                |                   |              |
| Hegarty 28 – Prime Numbers   |                   |              |
| Prime factors  |                   |              |
| Identify 2D and 3D shapes  |                   |              |
| Area   |                   |              |
| Volume of Cubes and Cuboids  |                   |              |

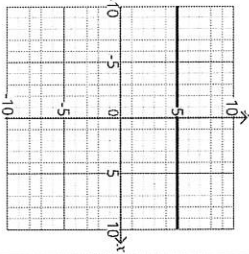
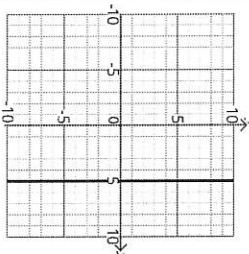
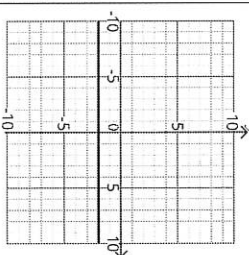
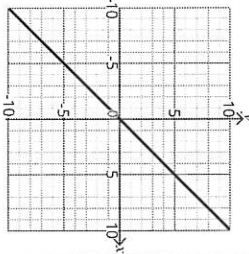
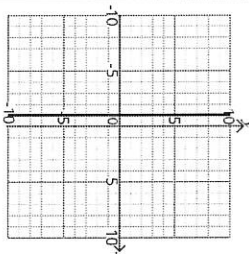
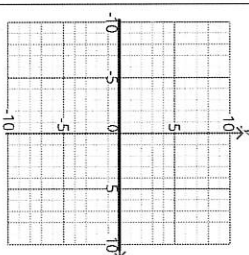
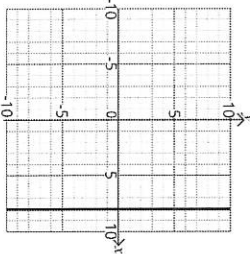
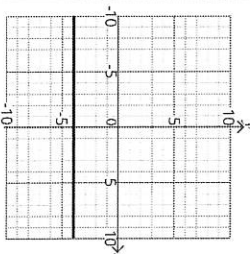
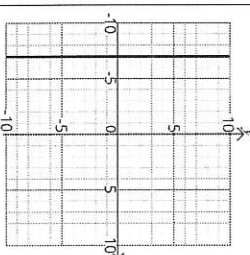


Your Turn

Straight Line Graphs - Equations of the form  $x = a$ ,  $y = b$  and  $y = x$

1. Match the equation of the lines to their graphs by placing the following under the correct graph:

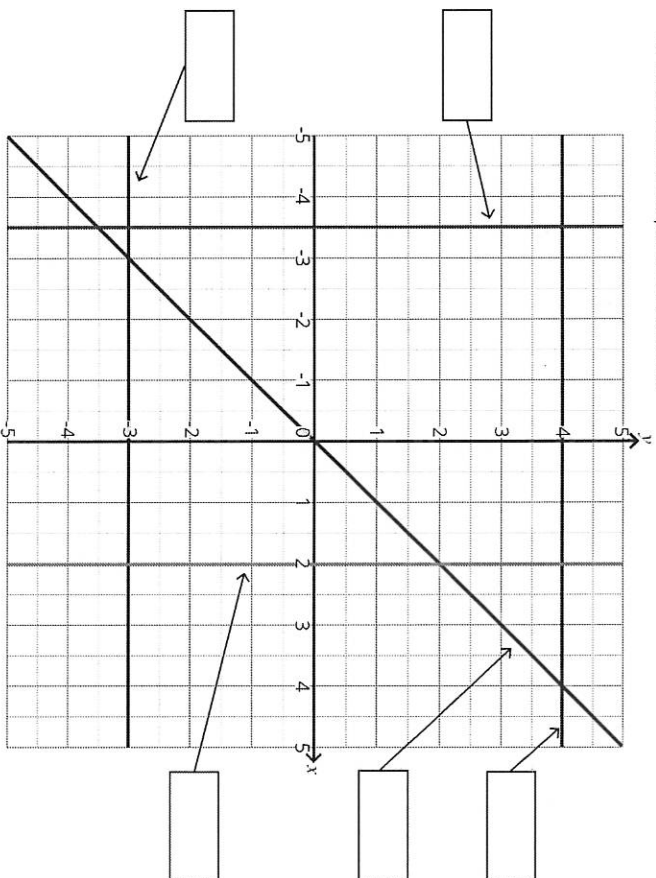
- $x = -1$
- $y = -2$
- $x = -7$
- $y = x$
- $x = 5$
- $x = 8$
- $y = 5$
- $y = -4$
- $y = 0$

|   |   |  |
|---|---|--|
|  |  |  |
|    |    |    |
|    |    |    |



Straight Line Graphs - Equations of the form  $x = a$ ,  $y = b$  and  $y = x$

2. Write down the equation of each line.



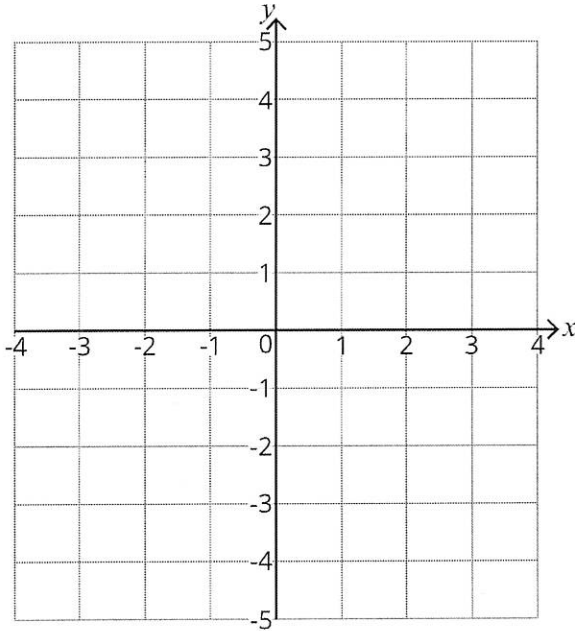
3. Write down the equation of the line that is parallel to the  $x$ -axis and passes through the point  $(1, 5)$ .  
\_\_\_\_\_
4. Write down the equation of the line that is parallel to the  $y$ -axis and passes through the point  $(-2, 4)$ .  
\_\_\_\_\_
5. Write down the equation of the line that is parallel to the  $x$ -axis and passes through the point  $(7.5, 1)$ .  
\_\_\_\_\_
6. Write down the equation of the line that is parallel to the  $y$ -axis and passes through the point  $(-3.4, -1)$ .  
\_\_\_\_\_
7. Write down the equation of the straight line that passes through the points  $(-8, -2)$  and  $(4, -2)$ .  
\_\_\_\_\_
8. Write down the equation of the straight line that passes through the points  $(-7, -1)$  and  $(-7, 9)$ .  
\_\_\_\_\_
9. Write down the equation of the straight line that passes through the points  $(-8, -8)$  and  $(12, 12)$ .  
\_\_\_\_\_



Your Turn

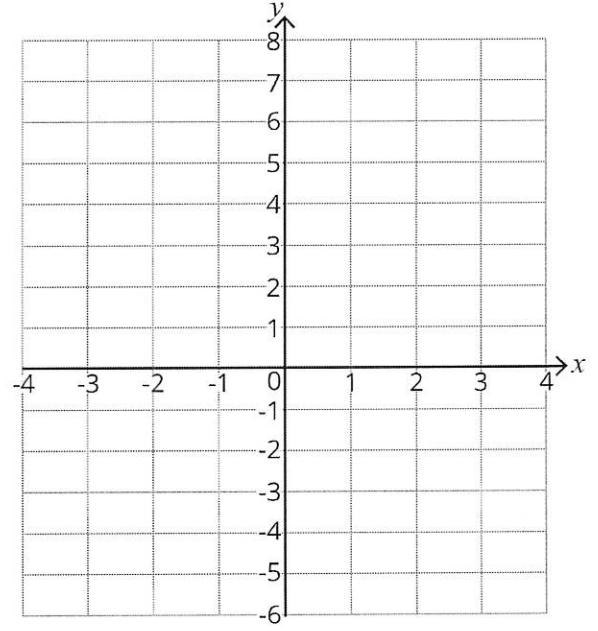
1. Draw the graph of  $y = x + 2$  for values of  $x$  from -3 to 3.

|     |    |    |    |   |   |   |   |
|-----|----|----|----|---|---|---|---|
| $x$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| $y$ |    |    |    |   |   |   |   |



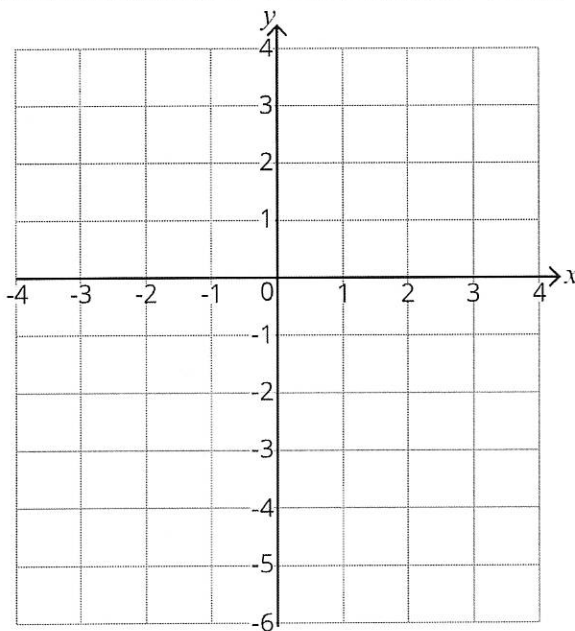
2. Draw the graph of  $y = 2x + 1$  for values of  $x$  from -3 to 3.

|     |    |    |    |   |   |   |   |
|-----|----|----|----|---|---|---|---|
| $x$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| $y$ |    |    |    |   |   |   |   |



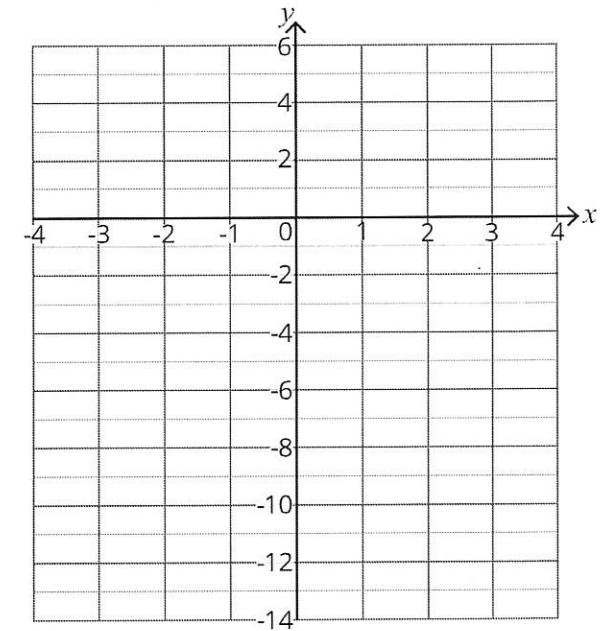
3. Draw the graph of  $y = x - 1$  for values of  $x$  from -3 to 3.

|     |    |    |    |   |   |   |   |
|-----|----|----|----|---|---|---|---|
| $x$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| $y$ |    |    |    |   |   |   |   |



4. Draw the graph of  $y = 3x - 4$  for values of  $x$  from -3 to 3.

|     |    |    |    |   |   |   |   |
|-----|----|----|----|---|---|---|---|
| $x$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| $y$ |    |    |    |   |   |   |   |



# Hegarty 156 – Collecting like terms

Complete these examples from the video.

## **Example**

Collect like terms

(i)  $a + a$

(ii)  $b + b + b$

## **Example**

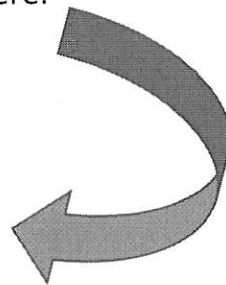
Simplify the following expression

$$2x + 5y + z + 7x + y + 3z$$

Now complete the quiz and write your score here.

Score =

%



## Hegarty 160 – Expanding a single bracket

Complete these examples from the video.

**Example**

Expand

(i)  $3(5 - y)$

(ii)  $-3(5 - y)$

**Example**

Expand

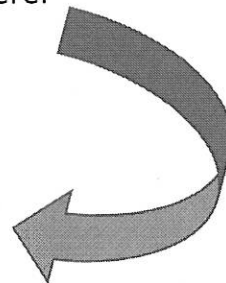
(i)  $a(2a + 6)$

(ii)  $3a(2a - 6)$

Now complete the quiz and write your score here.

**Score =**

**%**



# CHECK IT

1)  $5c + 9c$

3)  $5c \times 2a$

5)  $4a + 8a$

7)  $5b \times 5b$

9)  $3a \times 7a$

2)  $a \times 2a$

4)  $3a + 7a$

6)  $8a \times a$

8)  $a + 2a$

10)  $3c \times 4b$

*Simplifying*

# CHECK IT

1)  $8(3x - 5)$

3)  $6(5x - 6)$

5)  $8(2x + 7)$

7)  $5(6x + 5)$

9)  $7(6x - 5)$

2)  $8(9x - 5)$

4)  $10(8x + 1)$

6)  $4(9x + 10)$

8)  $10(4x + 5)$

10)  $2(2x - 3)$

*Expanding a single bracket*

# Solving Equations



Solve

1)  $x + 2 = 7$

2)  $x - 3 = 9$

3)  $4 + x = 10$

4)  $15 - x = 10$

5)  $3x = 15$

6)  $\frac{x}{3} = 6$

7)  $\frac{x}{6} = 3$

8)  $x - 3 = -1$

1)  $2x + 3 = 13$

2)  $5x - 1 = 14$

4)  $4x + 5 = 11$

5)  $\frac{x}{2} + 4 = 8$

3)  $10 + 2x = 30$

6)  $15 = 4x - 1$

# Factors and Multiples Revision

Circle the factors.

Factors of 15

2 3 6 5  
1 15 7 10

Factors of 20

2 4 6 5  
20 15 1 10

Factors of 48

3 7 4 6  
2 8 10 12  
25

Factors of 36

2 8 4 6  
10 12 15 18

Write the next four multiples.

|     |     |     |       |       |       |       |
|-----|-----|-----|-------|-------|-------|-------|
| 6,  | 12, | 18, | _____ | _____ | _____ | _____ |
| 27, | 36, | 45, | _____ | _____ | _____ | _____ |
| 20, | 25, | 30, | _____ | _____ | _____ | _____ |
| 21, | 28, | 35, | _____ | _____ | _____ | _____ |

Write the multiples of 8 that are greater than 20 but less than 60.

Write the multiples of 3 that are greater than 14 but less than 35.

Write the multiples of 4 that are greater than 10 but less than 41.

## Factors and Multiples Revision

F = Factor M = Multiple B = Both

Write the letters F, M or B next to the numbers.

F, M or B of 8

|    |  |  |  |
|----|--|--|--|
| 8  |  |  |  |
| 16 |  |  |  |
| 4  |  |  |  |
| 2  |  |  |  |

F, M or B of 10

|    |  |  |  |
|----|--|--|--|
| 5  |  |  |  |
| 20 |  |  |  |
| 10 |  |  |  |
| 30 |  |  |  |

F, M or B of 12

|    |  |  |  |
|----|--|--|--|
| 3  |  |  |  |
| 12 |  |  |  |
| 36 |  |  |  |
| 48 |  |  |  |

Colour the common factor for 12 and 15.

12      5      6      10  
15      3

Colour the common factor for 20 and 24.

10      12      20      42  
6      4

Colour the common factor for 36 and 45.

30      5      15      18  
9      6

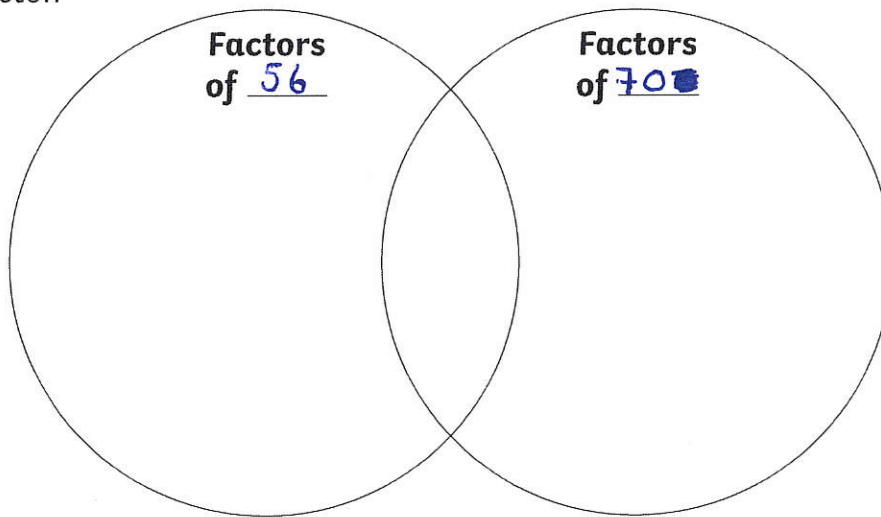




# Common Factors

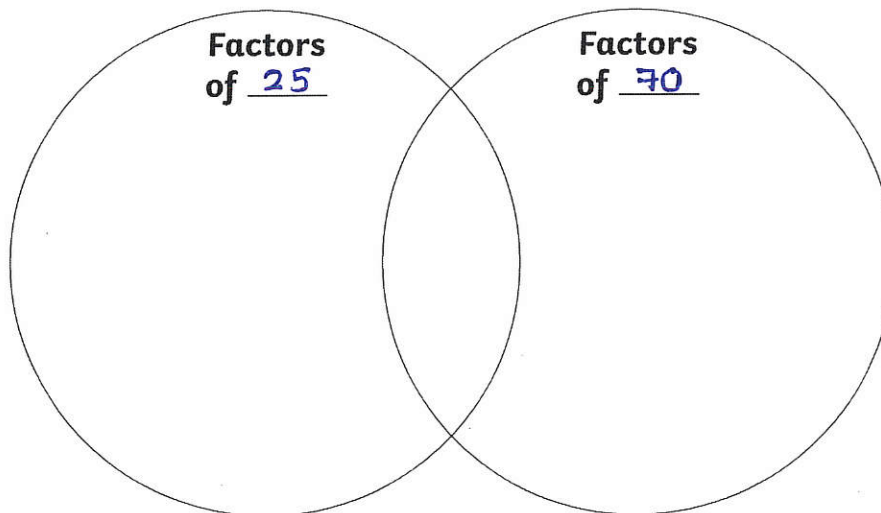
I can identify common factors

- d. Choose two numbers to compare. Complete the Venn diagram and identify the highest common factor.



The highest common factor is \_\_\_\_\_

- e. Choose two numbers to compare. Complete the Venn diagram and identify the highest common factor.



The highest common factor is \_\_\_\_\_

- f. Pavel says, "The highest common factor of 15 and 18 will be an even number because one of the numbers is even." Is Pavel correct? Explain your reasoning.

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# Hegarty 34 – Lowest Common Multiple

Complete these examples from the video.

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## Example

Find the lowest common multiple of 15 and 20.

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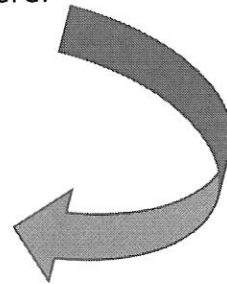
## Example

Find the LCM of 18 and 24.

Now complete the quiz and write your score here.

Score =

%



# Hegarty 28 – Prime Numbers

Complete these examples from the video.

## **Memory check**

You need to know all the prime numbers between 1 and 20!

Write down all the prime numbers between 1 and 100.

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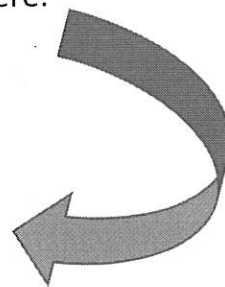
## **Example 3**

How many prime numbers are even? and what are they?

Now complete the quiz and write your score here.

**Score =**

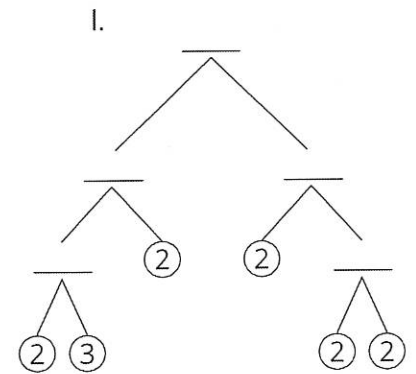
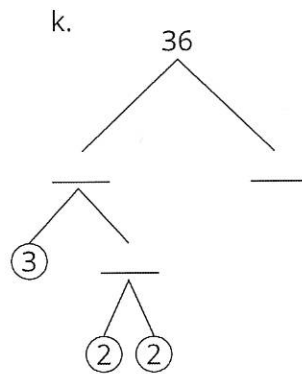
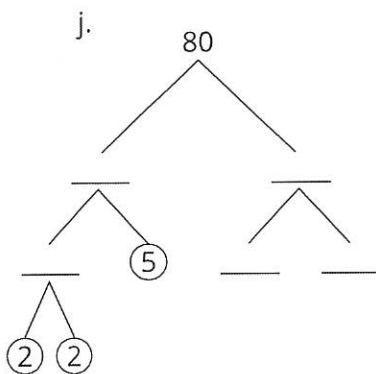
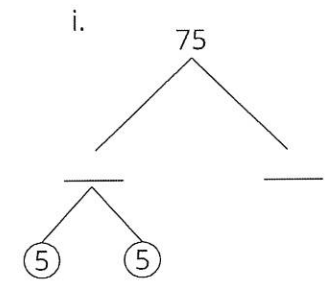
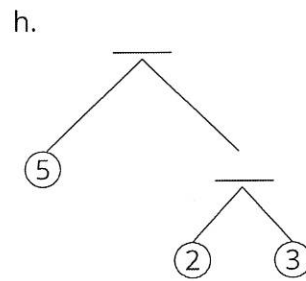
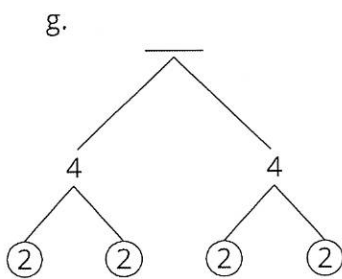
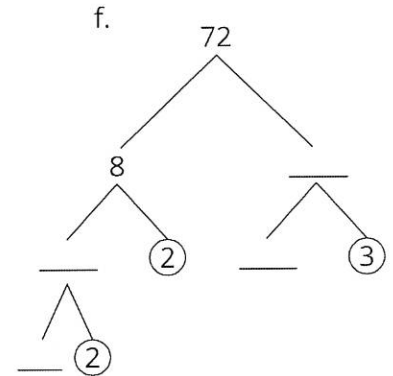
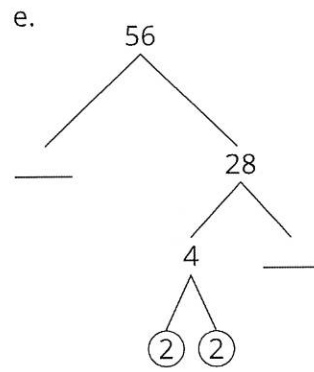
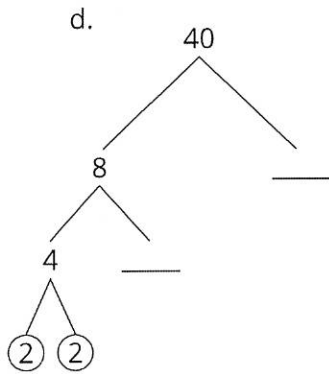
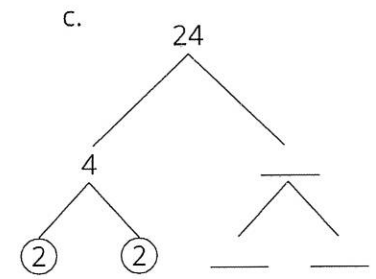
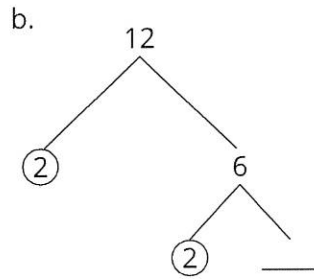
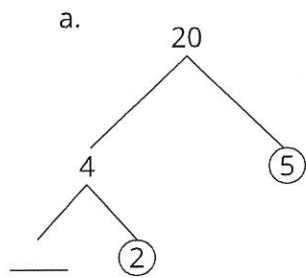
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# Prime Factors

1. Fill in the gaps in each prime factor tree.



2. Use a factor tree to find the product of prime factors of:


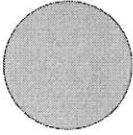
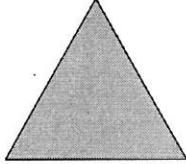
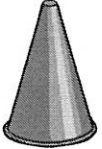
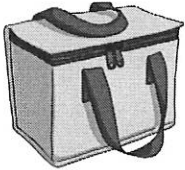

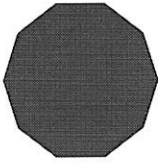
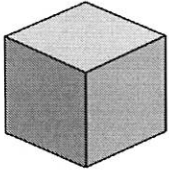
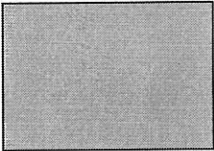


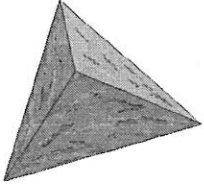
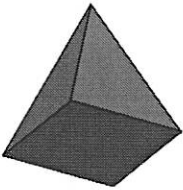
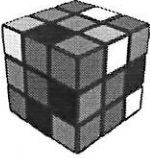


a. 48:  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

b. 100:  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

c. 144:  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

# Identify 2D and 3D shapes

Using the word bank, write the correct name of each 2D and 3D shape below.

|  |  |   |  |
|--|--|---|--|
| <br>_____   | <br>_____   | <br>_____   | <br>_____   |
| <br>_____   | <br>_____   | <br>_____   | <br>_____   |
| <br>_____ | <br>_____ | <br>_____ | <br>_____ |
| <br>_____ | <br>_____ | <br>_____ | <br>_____ |

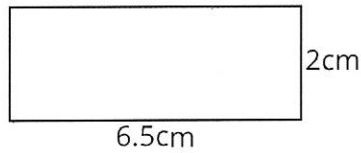
## Word Bank

|             |          |                      |                  |
|-------------|----------|----------------------|------------------|
| sphere      | kite     | square-based pyramid | triangular prism |
| decagon     | triangle | rectangle            | rhombus          |
| cone        | cylinder | cube                 | cuboid           |
| tetrahedron | circle   | rectangular prism    | cube             |

**Your Turn**

Don't forget to include the units of measurement with your answers. None of the diagrams are drawn accurately.

1. Calculate the area of the rectangle.

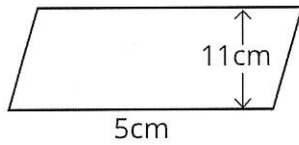



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2. Calculate the area of the parallelogram.

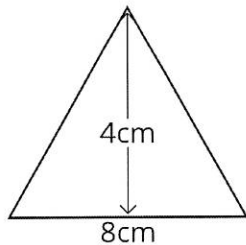



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3. Calculate the area of the triangle.

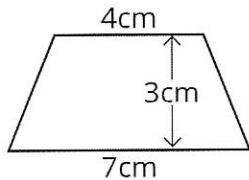



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4. Calculate the area of the trapezium.

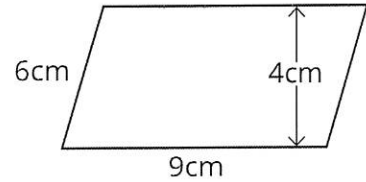



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5. Calculate the area of the parallelogram.

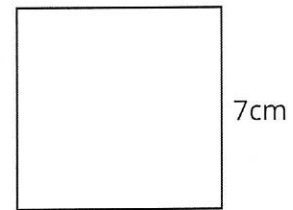



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6. Calculate the area of the square.

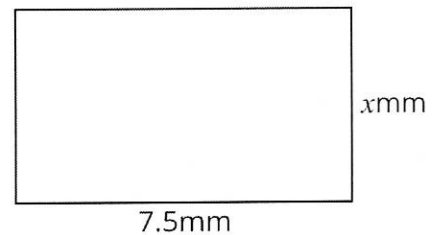



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7. The area of the rectangle is  $45\text{mm}^2$ . Calculate the missing value of the width marked  $x\text{mm}$ .



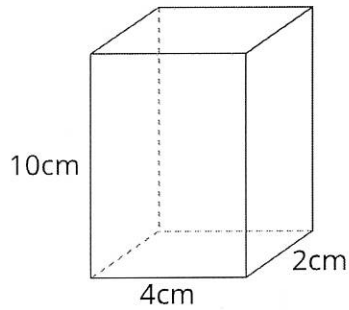

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### Your Turn

1. Calculate the volume of the cuboid, stating the units in your answer.

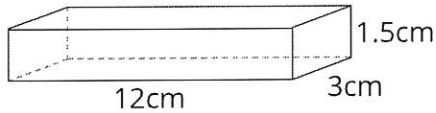



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2. Calculate the volume of the cuboid, stating the units in your answer.

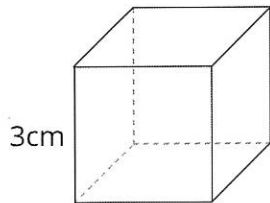



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3. Calculate the volume of the cube, stating the units in your answer.

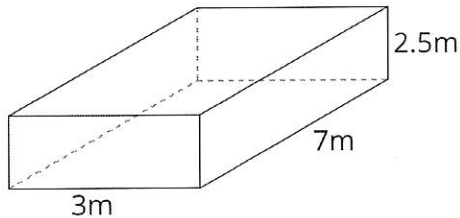



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4. Calculate the volume of the cuboid, stating the units in your answer.




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### Volume of Cubes and Cuboids

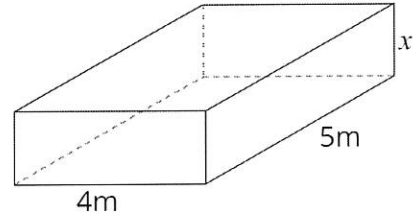
5. Calculate the volume of a cube with a height of 5cm.

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6. The volume of the cuboid is  $40\text{m}^3$ . Calculate the height ( $x$ ) of the cuboid.




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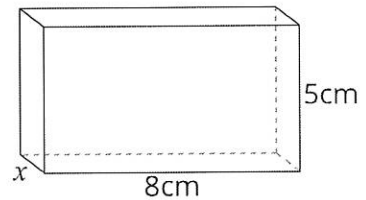


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7. The volume of the cuboid is  $20\text{cm}^3$ . Calculate the width ( $x$ ) of the cuboid.




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8. The volume of a cube is  $216\text{cm}^3$ . Calculate the length of the cube.

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