

Year 6 – 7 Maths summer worksheets.

The following are topics we often see students still having some difficulties with as they enter year 7. Please could we ask that you spend some time over the summer holidays working on these areas so that they are ready for the work in year 7. Some teachers may have highlighted specific areas for you to work on. Parents please encourage your child to complete these activities so that they are ready for year 7. Mark schemes are available on the HHS school maths web pages. <https://www.wensumtrust.org.uk/hellesdonhigh/curriculum/subject-pages/mathematics/maths>

If you required further work to help with these topics please use the following links:

<https://corbettmathsprimary.com/content/>

<https://www.bbc.co.uk/bitesize/subjects/z826n39/year/zncsscw>

<https://www.mathsgenie.co.uk/primary.html>

You can split numbers up into columns.

The digit in each column tells you how many of each thing you have:



Example 1

Write down the value, in words and as a number, of each digit in 2 730 491.

Write down how many you have in each column.

Then write each digit...

...in words...

...and as a number.

1 unit	one	1
9 tens	ninety	90
4 hundreds	four hundred	400
0 thousands	zero	0
3 ten-thousands	thirty thousand	30 000
7 hundred-thousands	seven hundred thousand	700 000
2 millions	two million	2 000 000

Questions:

For each of the following numbers, write down in numbers the value of the digit in:

- i) the tens column ii) the thousands column iii) the hundred-thousands column
- a) 1 283 458 b) 2 432 042 c) 7 263 982 d) 8 008 761

Example 2

Write the amount £4829309 in words.

1. First, split the number up into groups of three.
Start on the right-hand side
of the number and move left,
putting a space every three numbers.

£4 829 309

2. Then read each group from left to right.

£ 4 million, 829 thousand, 309

3. Write the number out fully in words.

**Four million, eight hundred and
twenty nine thousand, three
hundred and nine pounds.**



Questions:

Write each of these numbers in words.

- a) 15298 b) 40291 c) 82179 d) 74331

Write each of these numbers in words.

- a) 452123 b) 605128 c) 391407 d) 515398

Investigate — Place Value in Decimals

As with whole numbers, decimal numbers can
be split up into columns called decimal places:

units tenths hundredths
1 . 7 3

- a) Look at the number. The first two decimal columns are labelled.
Use what you know about the names of the columns in
whole numbers to label the column that would come next.
- b) Think about the number 1.7324.
What would you call the column that the 4 is in?
- c) Write out a number with 5 decimal places and label each column.
- d) How many decimal places would a number with a digit in the 'millionths'
column have? Write out a number with a 'millionths' column.
- e) What is the value of the 3 in the number 0.0000003 in words?
- f) Write out some more decimal numbers.
Find the value of each digit in each one.

Addition column method:

Example 1

Work out $1129 + 238$.

1. Write out one number above the other, making sure the units columns line up.

$$\begin{array}{r} 1129 \\ + 238 \\ \hline \end{array}$$

2. Add the columns from right to left. Start with the units. Carry the '1' into the tens column.

$$9 + 8 = 17$$

$$\begin{array}{r} 1129 \\ + 238 \\ \hline 17 \\ \hline \end{array}$$

3. Now add up the tens column, including the 1 carried over.

$$2 + 3 + 1 = 6$$

$$\begin{array}{r} 1129 \\ + 238 \\ \hline 67 \\ \hline \end{array}$$

4. Do the same with the hundreds column.

$$1 + 2 = 3$$

$$\begin{array}{r} 1129 \\ + 238 \\ \hline 367 \\ \hline \end{array}$$

5. When you get to the thousands column, there's no adding to do — so write the number straight into the answer.

$$\begin{array}{r} 1129 \\ + 238 \\ \hline 1367 \\ \hline \end{array}$$

Question:

Don't use a calculator for this exercise.

- 1 Complete the following additions.

a) $\begin{array}{r} 33 \\ + 22 \\ \hline \end{array}$

b) $\begin{array}{r} 11 \\ + 69 \\ \hline \end{array}$

c) $\begin{array}{r} 38 \\ + 27 \\ \hline \end{array}$

d) $\begin{array}{r} 45 \\ + 83 \\ \hline \end{array}$

- 2 Complete the following additions.

a) $\begin{array}{r} 183 \\ + 452 \\ \hline \end{array}$

b) $\begin{array}{r} 541 \\ + 367 \\ \hline \end{array}$

c) $\begin{array}{r} 367 \\ + 427 \\ \hline \end{array}$

d) $\begin{array}{r} 278 \\ + 199 \\ \hline \end{array}$

- 3 Complete the following additions.

a) $\begin{array}{r} 9012 \\ + 146 \\ \hline \end{array}$

b) $\begin{array}{r} 6702 \\ + 237 \\ \hline \end{array}$

c) $\begin{array}{r} 8353 \\ + 308 \\ \hline \end{array}$

d) $\begin{array}{r} 6721 \\ + 449 \\ \hline \end{array}$

Remember to lay these out in column method:

4 Work out the answers to these additions.

a) $12 + 928$

b) $821 + 72$

c) $726 + 28$

d) $88 + 212$

Investigate — Jam + Bun

Each of the letters in the words 'JAM' and 'BUN' stand for a different digit from 1 to 6 so that...

$$\begin{array}{r} \text{J A M} \\ + \text{B U N} \\ \hline 777 \end{array}$$



- Can you work out what each of the letters could stand for?
- Try making your own addition puzzles and get someone else to try them out.

Subtraction column method:

Example 2

Work out $759 - 378$.

- Write the first number above the second number with the units columns lined up.

$$\begin{array}{r} 759 \\ - 378 \\ \hline \end{array}$$

- Starting with the units column, take the bottom number away from the top number. $9 - 8 = 1$

$$\begin{array}{r} 759 \\ - 378 \\ \hline 1 \end{array}$$

- The top number in the next column is smaller than the bottom number, so 'borrow ten' from the next column along. This makes the '5' in the tens column into '15', and changes the '7' in the hundreds column into a '6'.

$$15 - 7 = 8$$

$$\begin{array}{r} 6\cancel{7}159 \\ - 378 \\ \hline 81 \end{array}$$

- Now do the subtraction in the tens column.

- Finally do the subtraction in the last column using the '6' as the top number.

$$6 - 3 = 3$$

$$\begin{array}{r} 6\cancel{7}159 \\ - 378 \\ \hline 381 \end{array}$$

Questions:

Don't use a calculator for this exercise.

1 Complete the following subtractions.

a)
$$\begin{array}{r} 75 \\ - 14 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 82 \\ - 51 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 83 \\ - 72 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 64 \\ - 51 \\ \hline \end{array}$$

2 Complete the following subtractions.

a)
$$\begin{array}{r} 999 \\ - 831 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 679 \\ - 567 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 484 \\ - 326 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 632 \\ - 517 \\ \hline \end{array}$$

Remember to use column method

3 Work out the answers to these subtractions.

a) $51 - 42$

b) $31 - 28$

c) $94 - 38$

d) $66 - 49$

Adding and subtracting decimals:

Decimal numbers can be split up into columns, just like whole numbers. The columns after the decimal point are called decimal places.



To add or subtract decimals you have to line up the decimal places, just as you would with whole numbers.

Example 3

Work out $1.281 + 2.23$.

1. First write one number above the other, making sure that the decimal points line up.

$$\begin{array}{r} 1.281 \\ + 2.23 \\ \hline \end{array}$$

2. Add up the columns from right to left, just as you would when adding whole numbers.

There isn't a digit in the first column for the bottom number — so add in a 0.

$$\begin{array}{r} 1.281 \\ + 2.230 \\ \hline 3.511 \end{array}$$

3. Include a decimal point in your answer.

It must line up with the decimal points in the question.

$$3.511$$

Questions:

Don't use a calculator for this exercise.

1 Complete the following additions.

a)
$$\begin{array}{r} 3.1 \\ + 3.6 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 5.6 \\ + 4.3 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 3.8 \\ + 2.4 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 0.7 \\ + 4.8 \\ \hline \end{array}$$

2 Complete the following additions.

a)
$$\begin{array}{r} 7.35 \\ + 4.22 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 5.64 \\ + 2.92 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 6.28 \\ + 7.96 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 0.78 \\ + 0.54 \\ \hline \end{array}$$

Remember to line up the decimal point in column method

4 Work out the following calculations.

a) $7.38 + 2.28$

b) $0.28 + 8.39$

c) $7.82 + 1.03$

d) $3.23 + 9.93$

Example 4

Work out $12.04 - 8.57$.

1. Write the first number above the second.
Make sure the decimal points are lined up.

$$\begin{array}{r} 12.04 \\ - 8.57 \\ \hline \end{array}$$

2. Starting with the right-hand column, take the bottom number away from the top number.

4 is smaller than 7, so you need to borrow ten from the next column to the left. This column contains a zero, which means there are no tens in this column to borrow.

Go another column to the left until you find a non-zero value. Borrow ten from this column for the column containing a 0.

$$\begin{array}{r} 1 \quad 10 \\ 12.04 \\ - 8.57 \\ \hline \end{array}$$

3. The column now has a non-zero value.
You can borrow ten as usual.

$$\begin{array}{r} 9 \\ 1 \quad 10 \\ 12.04 \\ - 8.57 \\ \hline \end{array}$$

4. Continue with the subtraction, just as you would with whole numbers. Include the decimal point in your answer. It must line up with the decimal points in the question.

$$\begin{array}{r} 9 \\ 0 \quad 1 \quad 10 \\ 12.04 \\ - 8.57 \\ \hline 03.47 \end{array}$$

Questions:

Don't use a calculator for this exercise.

1 Work out the answers to these subtractions.

$$\begin{array}{r} \text{a)} \quad 3.9 \\ - 1.2 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b)} \quad 9.2 \\ - 5.1 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c)} \quad 6.7 \\ - 0.8 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d)} \quad 8.3 \\ - 4.5 \\ \hline \end{array}$$

2 Work out the answers to these subtractions.

$$\begin{array}{r} \text{a)} \quad 7.452 \\ - 4.87 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b)} \quad 9.621 \\ - 7.25 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c)} \quad 8.439 \\ - 3.28 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d)} \quad 6.647 \\ - 5.39 \\ \hline \end{array}$$

Remember to line up the decimal point in column method

3 Work out the following subtractions.

$$\text{a)} \quad 1.8 - 0.7$$

$$\text{b)} \quad 2.5 - 1.7$$

$$\text{c)} \quad 6.1 - 2.8$$

$$\text{d)} \quad 8.1 - 6.7$$

Times tables and multiplication:

We should be fluent in most of our times tables. We need to make sure that we are fluent in at least twos, fives, and tens.

$$1 \times 10 = \square \quad 2 \times 10 = \square$$

$$3 \times 10 = \square \quad 10 \times 5 = \square$$

$$10 \times 7 = \square \quad 8 \times 2 = \square$$

$$10 \times 4 = \square \quad 3 \times 10 = \square$$

$$2 \times 6 = \square \quad 5 \times 6 = \square$$

$$2 \times 9 = \square \quad 5 \times 10 = \square$$

$$1 \times 2 = \square \quad 7 \times 2 = \square$$

$$3 \times 2 = \square \quad 10 \times 9 = \square$$

$$5 \times 8 = \square \quad 2 \times 10 = \square$$

$$5 \times 4 = \square \quad 4 \times 2 = \square$$

$$7 \times 5 = \square \quad 5 \times 8 = \square$$

$$10 \times 5 = \square \quad 15 \times 10 = \square$$

$$5 \times 2 = \square \quad 25 \times 2 = \square$$

Example 5Calculate 398×53 using the column method.

1. Write one number above the other and make sure the columns line up. It's best to put the bigger number on the top.

$$\begin{array}{r} 398 \\ \times 53 \\ \hline \end{array}$$

2. Start by working out 398×3 .
Multiply each digit in 398 by 3, working from right to left.
If the answer is 10 or more, carry the tens digit.
E.g. $3 \times 8 = 24$, so write the 4 in the units column and carry the 2. Then $3 \times 9 = 27$, plus the carried 2 gives 29.

$$\begin{array}{r} 398 \\ \times 53 \\ \hline 11\text{ }_2\text{ }_2\text{ }_4 \end{array}$$

3. Work out 398×50 on the next row.
You can do this by putting a 0 in the right-hand column and multiplying each digit in 398 by 5.
Work from right to left.

$$\begin{array}{r} 398 \\ \times 53 \\ \hline 11\text{ }_2\text{ }_2\text{ }_4 \\ 19\text{ }_4\text{ }_9\text{ }_0\text{ }_0 \end{array}$$

4. Add the two rows together to get your final answer.

$$\begin{array}{r} 398 \\ \times 53 \\ \hline 11\text{ }_2\text{ }_2\text{ }_4 \\ + 19\text{ }_4\text{ }_9\text{ }_0\text{ }_0 \\ \hline 21\text{ }_1\text{ }_0\text{ }_9\text{ }_4 \end{array}$$

Questions:

Using Column method answer the following

Work out the answers to the following multiplications.

a) 26×8

b) 83×5

c) 7×65

d) 92×6

e) 4×34

Bus/train timetables:

Timetables usually show times written in 24-hour clock time.
You can use them to help you plan a journey.

Example 6

- a) A bus leaves Eastwick at 09:00. What time does it arrive in Westfield?

Northpost	0803	0848	0921
Eastwick	0815	0900	0933
Southdale	0827	0912	0945
Westfield	0835	0920	0953

1. Find the row for Eastwick and read across until you get to 09:00.
2. Follow the column down until you get to the row for Westfield. **09:20**

- b) Freddie needs to be in Southdale before 9:30 am.
What's the latest time he can leave Northpost?

1. Look at the row for Southdale — there are 2 buses that arrive before 9:30 am. **The buses arrive in Southdale at 08:27 and 09:12.**
2. Follow the columns up until you find the time each bus leaves Northpost. **The latest time he can leave Northpost is 08:48.**

Question:

Use this bus timetable to answer all the questions in this exercise.

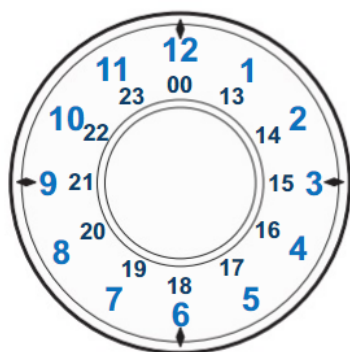
Lythington	0530	0645	0810	0920	1015
Greenpool	0632	0747	0912	1022	1117
Penworthy	0651	0806	0931	1042	1136
Underwood	0728	0843	1008	1119	1213
Islingham	0806	0921	1046	1157	1251
Towervale	0858	1013	1138	1249	1343

- 1 a) What time does the earliest bus for Islingham leave Greenpool?
b) What time does this bus arrive in Islingham?
c) How long does this journey take?
- 2 Louisa lives in Penworthy.
a) What time is the latest bus she can catch to Towervale?
b) What time does this bus arrive in Towervale?
c) Give the departure and arrival times of this bus in 12-hour clock time.



Time:

Times can be given in the [12-hour clock](#) or the [24-hour clock](#).



Starting at midnight, the first time round the clock runs from...	
<u>24-hour clock</u>	<u>12-hour clock</u>
00:00	12 midnight
to	to
11:59	11:59 am

and the second time round runs from...	
<u>24-hour clock</u>	<u>12-hour clock</u>
12:00	12 noon
to	to
23:59	11:59 pm

12-hour clock times need 'am' or 'pm' to show if the time is before or after noon.
24-hour clock times always have four digits, e.g. 02:30.

For times from 1:00 pm, add 12 hours to the 12-hour clock time to get the 24-hour clock time (or subtract 12 hours from the 24-hour clock time to get the 12-hour clock time).

Example 1

- a) Write 8:30 pm using 24-hour clock time.

This time is after 1:00 pm, so add
12 hours to the 12-hour clock time.

$$8:30 + 12:00 = 20:30$$

in 24-hour clock

- b) Write 18:10 using 12-hour clock time.

1. This time is after 13:00, so subtract 12 hours
from the 24-hour clock time.

$$18:10 - 12:00 = 6:10 \text{ pm}$$

in 12-hour clock

2. It needs a 'pm' to show that it's after noon.

Questions

- 1 Write these 12-hour clock times as 24-hour clock times.

a) 7:35 am

b) 12:15 pm

c) 3:20 am

- 2 Write these 24-hour clock times as 12-hour clock times.

a) 09:50

b) 15:20

c) 04:15

d) 12:18

- 3 Write each of these times using: I) the 12-hour clock II) the 24-hour clock

a) 4 o'clock in the afternoon

b) Half past eight in the morning

c) Ten past eleven in the evening

d) Quarter past six in the morning

The standard units of time are hours, minutes and seconds.
There are 60 seconds in a minute and 60 minutes in an hour.
You can use these facts to convert between hours, minutes and seconds.

Example 2

**Peter cycles for 3 hours and 20 minutes.
What is this time in minutes?**

1. First, change 3 hours into minutes by multiplying by 60. $1 \text{ hour} = 60 \text{ minutes, so}$
 $3 \text{ hours} = 3 \times 60 = 180 \text{ minutes}$
2. Then add on the remaining 20 minutes to find the total time in minutes. $180 + 20 = 200 \text{ minutes}$

Example 3

**A music video lasts for 165 seconds.
What is this in minutes and seconds?**

1. Change 165 seconds into minutes by dividing by 60. $1 \text{ minute} = 60 \text{ seconds, so}$
 $165 \text{ seconds} = 165 \div 60 = 2.75 \text{ minutes}$
2. So 165 seconds is 2 whole minutes plus 0.75 of a minute.
3. Find 0.75 of a minute in seconds by multiplying by 60. $0.75 \times 60 = 45 \text{ seconds}$
4. Finally, put the whole minutes and the seconds together. $165 \text{ seconds} = 2 \text{ minutes and } 45 \text{ seconds}$

Questions:

1 Rewrite these times in minutes:

- a) 2 hours b) 6 hours c) 4 hours and 30 minutes d) 5 hours and 25 minutes

2 Rewrite these times in seconds:

- a) 5 minutes b) 8 minutes c) 15 minutes
d) 11 minutes e) 3 minutes and 15 seconds f) 4 minutes and 10 seconds

3 Rewrite these times in hours and minutes:

- a) 180 minutes b) 150 minutes c) 225 minutes d) 247 minutes

Investigate — Time

Imagine a new world, where there are 100 seconds in a new-minute, and 100 new-minutes in a new-hour.



- Would a new-minute be longer or shorter than one of our minutes?
- How many seconds would be in a new-hour?
How many new-minutes long would your maths lesson be?
- Design a clock for the new world.
How many new-hours do you think there would be in a new-day?

Bar charts:

Bar charts (and **bar-line charts**) show how many items fall into different categories. The number of items in each category is the **frequency**.

Please note: Bars are equal width, the gaps are equal width, there is a gap at the start and the axis are labelled.

Example 3

Will asked everyone in his class how they get to school. The bar chart shows the results.

- a) What was the most popular transport?

Look for the tallest bar.

Bus was the most popular.

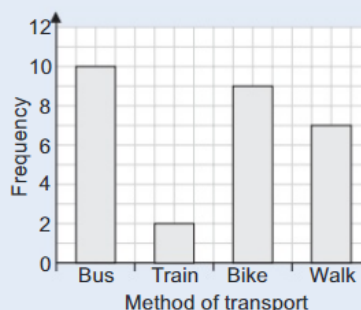
- b) How many people did Will ask?

Add together the frequencies $10 + 2 + 9 + 7$
for each type of transport. **$= 28$**

- c) What percentage of people walk to school?

1. Look at the 'Walk' bar. 7 people out of the total of 28 said 'walk'. Write this as a fraction.

2. Divide the top number by the bottom number and multiply by 100.



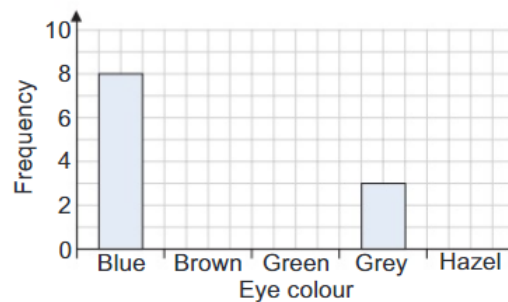
$\frac{7}{28}$ of people walk

$$(7 \div 28) \times 100 = 25\%$$

Questions

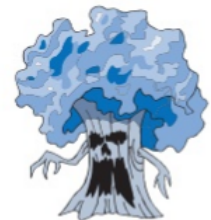
- 1 Alice records the different eye colours of people in her class in a frequency table. Copy and complete the bar chart using the information from the frequency table.

Eye Colour	Frequency
Blue	8
Brown	9
Green	2
Grey	3
Hazel	4

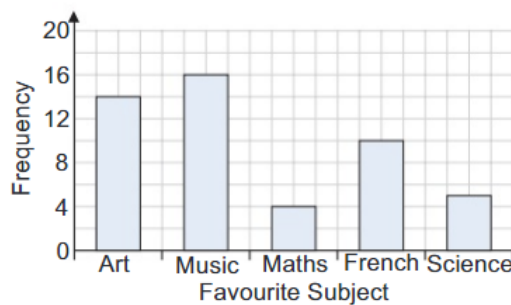


- 2 Fraser records the different types of DVDs he owns. The results are in the frequency table. Draw a bar chart to show this information.

DVD	Action	Comedy	Horror	Rom Com
Frequency	6	8	4	2



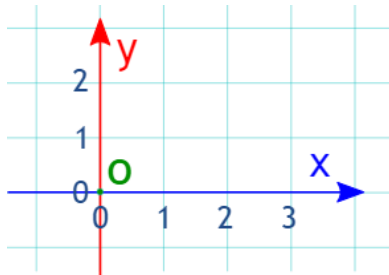
- 5 Leah asks the people in her year what their favourite subject is and draws a bar chart to show her results. Use the bar chart to complete the frequency table.



Favourite Subject	Frequency
Art	14
Music	
Maths	
French	
Science	

Axis for graphs:

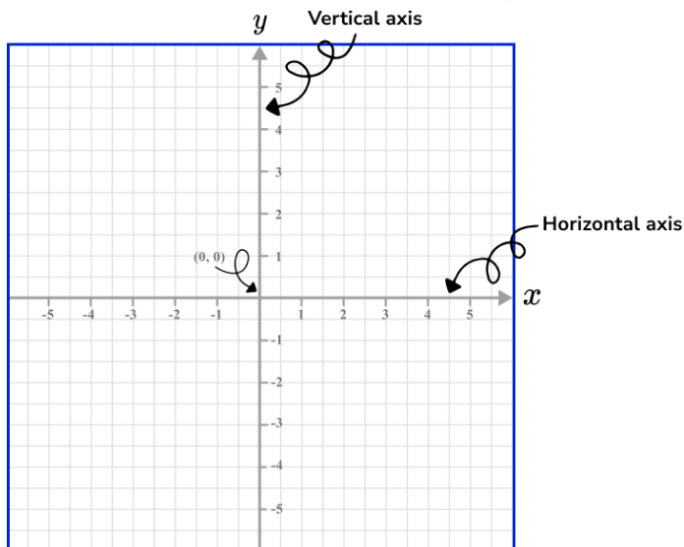
Axes is the plural of axis. An axis is the reference line that is used to measure coordinates on graphs and grids.



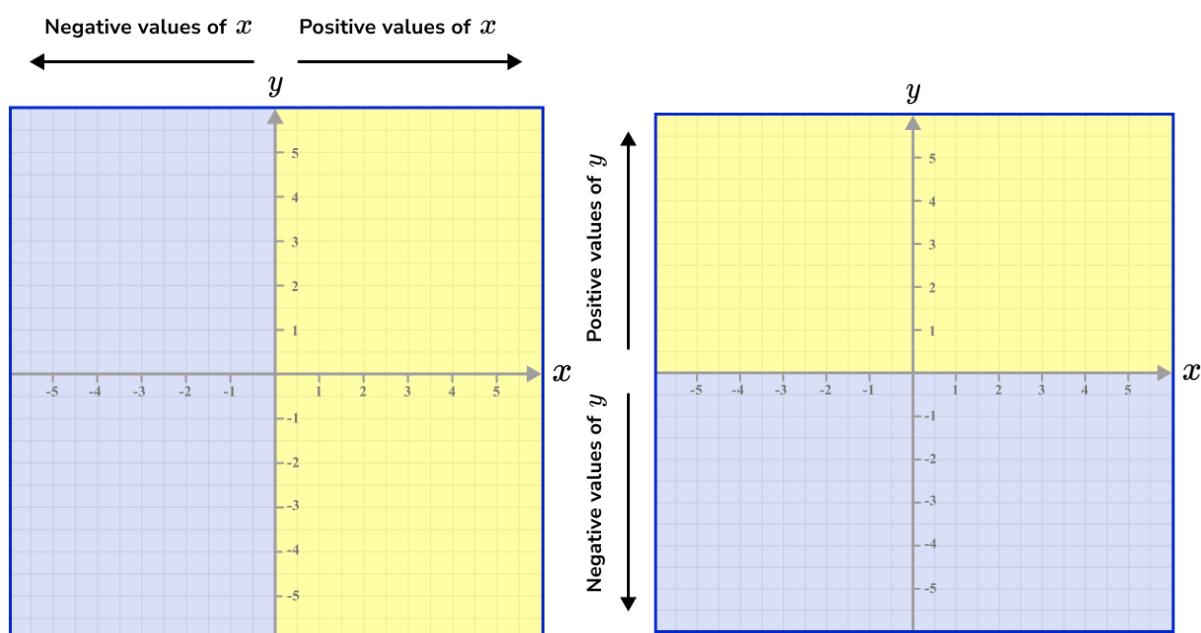
The x-axis is a **horizontal line** (left to right).

The y-axis is a **vertical line** (up and down).

The x-axis and y-axis intersect at the **origin** (0,0).(0,0).



Coordinates must be written as a **pair of values**, separated by a **comma**, and surrounded by a set of **round brackets** e.g. (3,2),(-4,0),(-6.3,5.7).(3,2),(-4,0),(-6.3,5.7).

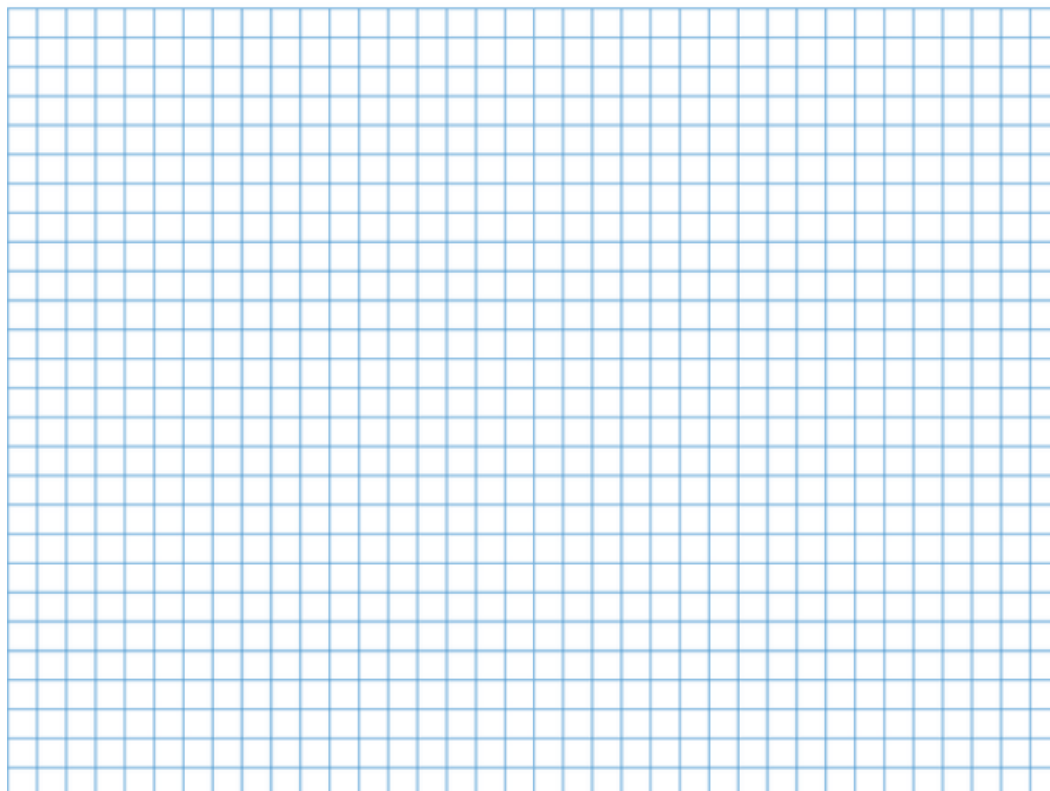


Common misconceptions

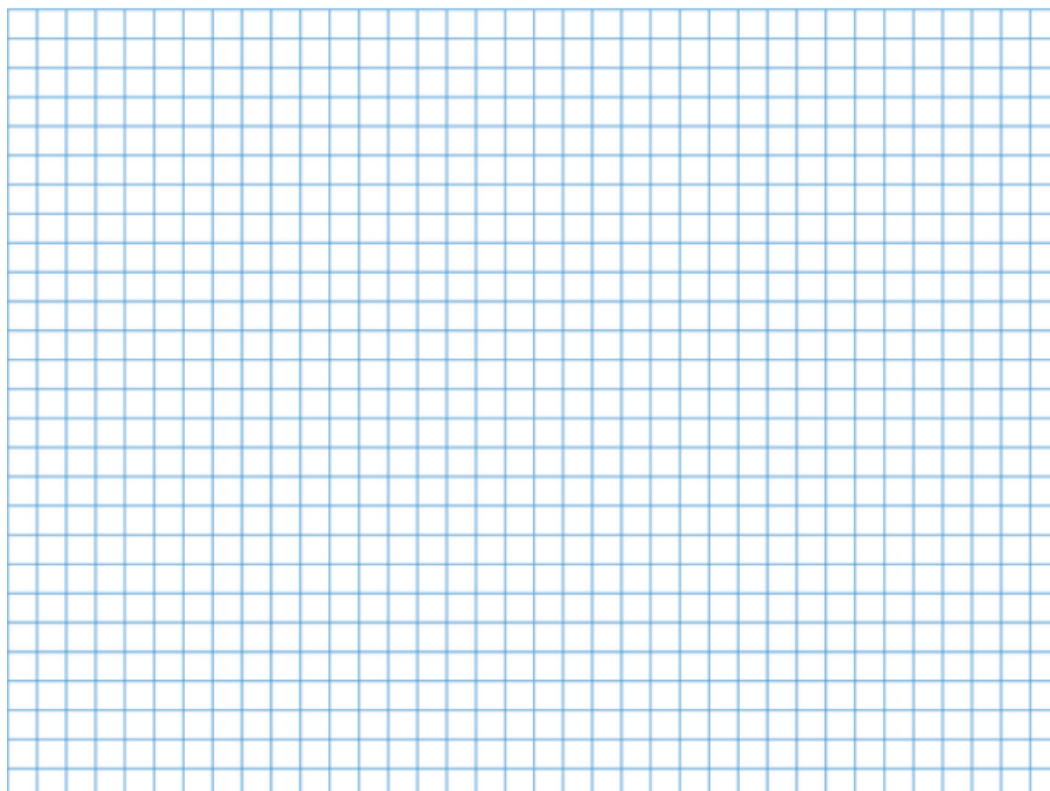
- The gaps between the values on either axis have to be equal
- The scale on the axis is very important as if the values are not spaced correctly then the chart will not represent the data accurately.
- **Unequal spacing between tick marks on a single axis**
- When drawing a set of axes, the spacing between each tick mark must be the same; if four squares represents 11 unit increase, the next tick mark should be 44 squares along and labelled 11 more than the previous tick mark.
- **Incorrect axis labels (missing units)**
- Make sure that the row / column title of the table matches the axis on the graph. If the column title is "Time (mins)", you must write "Time (mins)" and not "Time" as the unit is not specified and so any value taken from the graph may be misinterpreted.
- **Incorrect axis labels (switched labels)**
- Make sure that the row / column title of the table matches the axis on the graph. The scale on the axis should be labelled with the correct title (e.g. the horizontal axis for a bar chart with categories: Dog, Cat, Rabbit, Horse, Other, should be labelled as "Favourite pet" and not "Frequency".
- **The axis scale does not allow for all points to be plotted**
- You must make sure that the scale for each axis will allow all values in the data set to be plotted.
- **The axis labels and step marks are too close together / too far apart**
- When the axis is drawn, you do not need to label every square with a value. Conversely, do not only write the highest value at the end of the axis, and 00 at the origin. Most of the time you will be given a suitable grid for you to plot a graph or chart to a suitable size.

Questions:

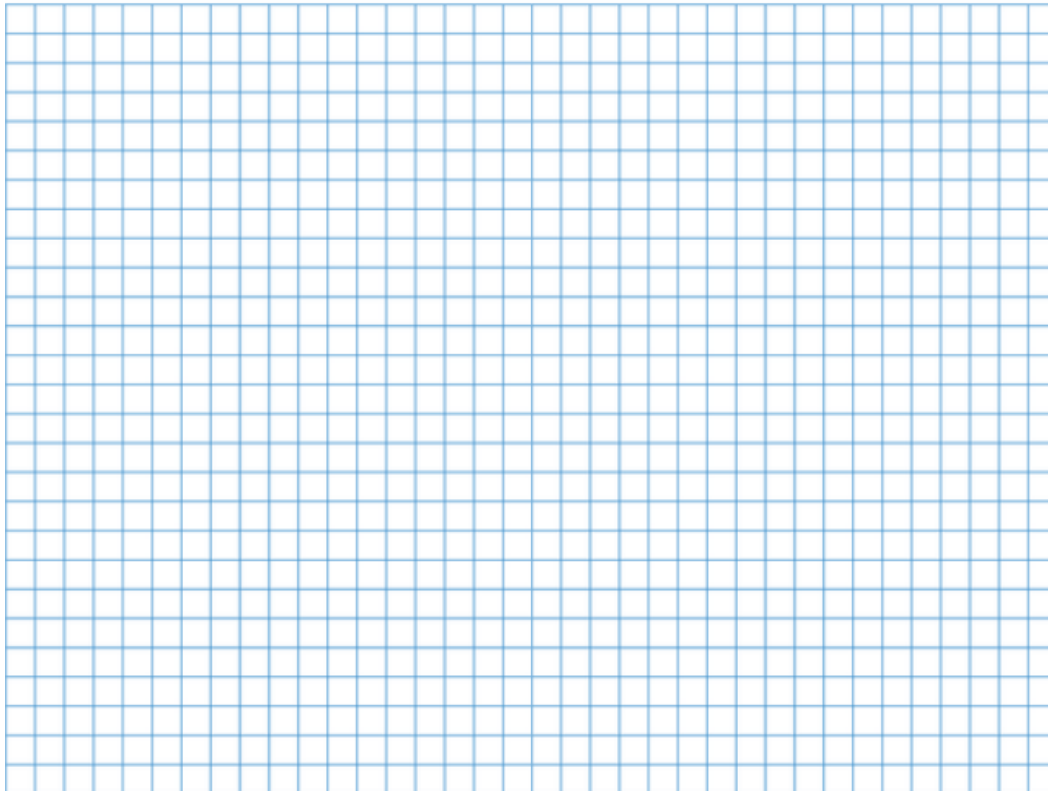
1. On the squared paper Draw an axis that has both x and y values from -5 to 5



2. On the squared paper Draw an axis that has both x and y values from -10 to 10



3. On the squared paper Draw an axis that has both x values from -5 to 5 and y values from -5 to 10



The standard units of money in the UK are pounds (£) and pence (p).

$$\text{£1} = 100\text{p and } 1\text{p} = \text{£0.01}$$

Money:

The different coins used are 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2, and there are £5, £10, £20 and £50 notes as well. Any amount of money can be made from different combinations of these coins and notes — for example, £36 could be made from a £20 note, a £10 note, a £5 note and a £1 coin (there are other ways to make this amount).

Other currencies are worth different amounts but they work in a similar way — there are 100 cents in a euro (€) and 100 cents in an American dollar (\$).

To convert between different currencies, you need to know the [exchange rate](#).

Example 1

Aaron has been saving 1p, 2p and 5p coins.
He has 176 pennies, 92 2p coins and 48 5p coins.
Work out the smallest number of notes and coins
he could change these for at the bank.

1. First, work out how much money he has in total (in £).
2. Then work out how to make this amount using the smallest number of coins and notes.

$$\begin{aligned}
 176 \text{ 1p coins} &= 176\text{p} \\
 92 \text{ 2p coins} &= 92 \times 2 = 184\text{p} \\
 48 \text{ 5p coins} &= 48 \times 5 = 240\text{p} \\
 \text{Total} &= 176\text{p} + 184\text{p} + 240\text{p} = 600\text{p} = \text{£}6 \\
 \text{£}6 &= \text{£}5 + \text{£}1 \\
 &= \text{one £5 note and one £1 coin}
 \end{aligned}$$

Questions

- 1 Find the total amount of money for each set of coins and notes.
 - a) One £20 note, two £10 notes, four £1 coins and one 50p coin
 - b) Three £10 notes, one £5 note, four £2 coins, three 20p coins and one 5p coin
 - c) Four £5 notes, three £1 coins, one 50p coin, three 20p coins and two 5p coins
 - d) Two £20 notes, three £5 notes, six £2 coins, five 50p coins and eight 2p coins
- 2 Kelly is going on holiday to Italy. She has one €100 note, five €50 notes, four €20 notes, four €10 notes and eight €5 notes. How much money does she have in total?
- 4 Molly's grandma gives her a jar of coins.
In the jar, there are 206 1p coins, 112 2p coins and 46 5p coins.
 - a) How much money is there in the jar? Give your answer in pounds.
 - b) Find the smallest number of coins and notes she could exchange this for at the bank.

**Example 2**

A bank offers an exchange rate from pounds to euros
of £1 = €1.10.

- a) Mia wants to change some money into euros at the bank.
How many euros will she get for £150?

£1 is worth €1.10, so multiply the amount she wants to change by the exchange rate.

$$\text{£}150 \times 1.10 = \text{€}165$$

- b) After her holiday, she has €22 left. How many pounds can she exchange her euros for at the same exchange rate?

1. Using the exchange rate, work out how much €1 is worth.

$$\begin{aligned}
 \text{€}1.10 &= \text{£}1, \\
 \text{so } \text{€}1 &= \text{£}1 \div 1.10 = \text{£}0.909...
 \end{aligned}$$

2. Then multiply by the number of euros Mia has.

$$\text{€}22 = 22 \times \text{£}0.909... = \text{£}20$$

Questions

5 Convert the following amounts into dollars (\$) if £1 is worth \$1.50.

- | | | | |
|--------|---------|---------|-----------|
| a) £10 | b) £200 | c) £120 | d) £80 |
| e) £75 | f) £165 | g) £295 | h) £32.50 |

6 Convert the following amounts into euros (€) if £1 is worth €1.20.

- | | | | |
|--------|---------|---------|-----------|
| a) £20 | b) £500 | c) £350 | d) £60 |
| e) £45 | f) £195 | g) £235 | h) £22.50 |

To compare prices and find the 'best buy', you have to look at [unit pricing](#). This means dividing to find the price per unit (e.g. per item, per gram, per litre) or amount per penny (e.g. grams per penny).

Example 3

6 cakes cost £15. Find the cost of 10 cakes.

1. Find the cost of one cake by dividing the total cost by the number of cakes.
2. Then multiply by the new number of cakes.

6 cakes cost £15 so 1 cake costs
 $£15 \div 6 = £2.50$

10 cakes cost
 $10 \times £2.50 = £25$



Questions

1 1 pizza costs £8. Find the cost of:

- | | | |
|-------------|-------------|--------------|
| a) 3 pizzas | b) 7 pizzas | c) 15 pizzas |
|-------------|-------------|--------------|

2 6 cupcakes cost £9.

- a) Find the cost of 1 cupcake.
- b) Use your answer to part a) to find the cost of 20 cupcakes.

3 4 candles cost £3.60. Find the cost of:

a) 1 candle

b) 8 candles

c) 25 candles

4 5 kg of compost costs £7.50. Find the cost of:

a) 10 kg of compost

b) 3 kg of compost

c) 100 kg of compost

Compass and protractor work:

For this topic, you'll need to use a **ruler** for measuring lengths...



...and a **protractor** for measuring angles.

Don't get these two scales mixed up — they start at opposite sides of the protractor so you need to use the right one.

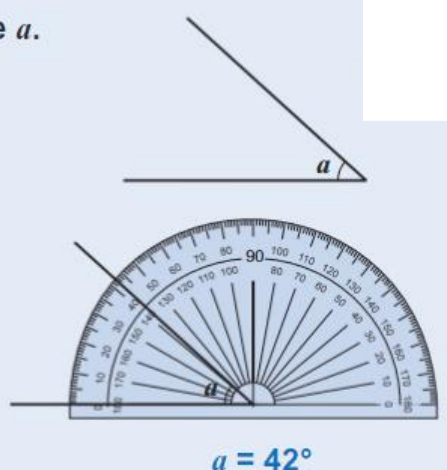


Angles are measured in degrees ($^{\circ}$), for example, 90° .

Example 1

Measure the size of angle a .

1. Line up the 0° line of the protractor with the horizontal line.
2. Put the protractor's cross exactly where the two lines meet.
3. Read off the value where the line crosses the protractor's scale — make sure you use the correct scale. (You might have to extend the line to read off the value.)

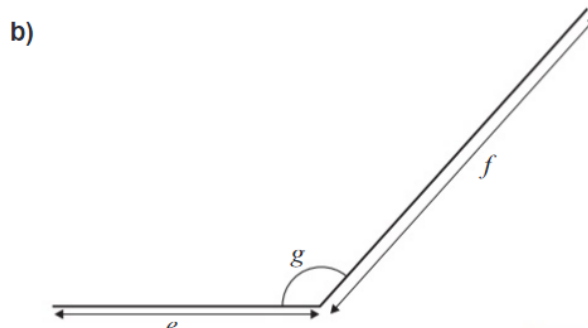
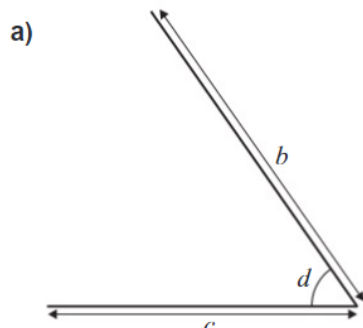


Questions

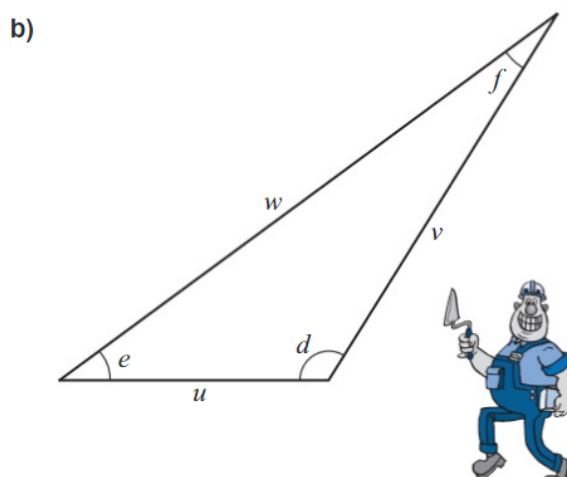
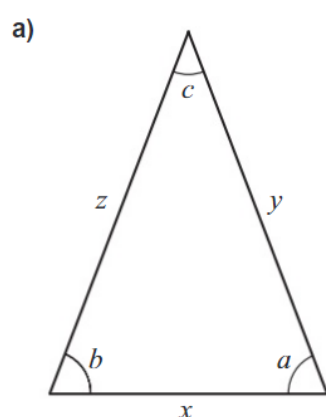
Exercise 1

In this exercise, give all answers to the nearest **whole number**.

- 1 In each diagram use a ruler to measure the lengths of the two sides, in mm. Then use a protractor to measure the size of the angle between them.



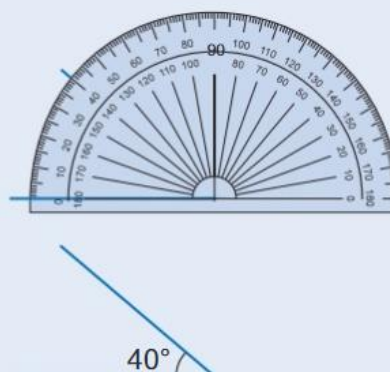
- 2 Give the lengths of all three sides, in mm, and the size of all three angles in each of these triangles.



Example 2

Draw an angle of 40° .

1. Start by drawing a horizontal line.
2. Line up the 0° line of the protractor with the horizontal line and put the protractor's cross exactly at one end.
3. Count up the scale from 0° and put a mark at 40° .
4. Take away the protractor. Use a ruler to join the mark to the end of the horizontal line.



Questions

4 Use a protractor to draw angles of the following sizes.

a) 90°

b) 20°

c) 38°

d) 120°

e) 135°

f) 152°



5 a) Draw a horizontal line 9 cm long.

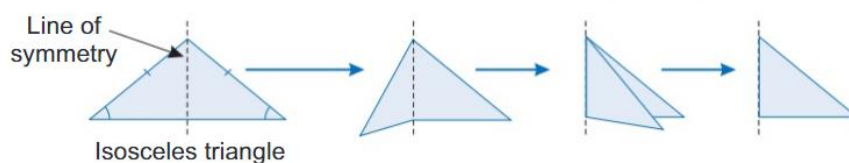
b) On one end of the line, draw a line at an angle of 60° above the first line.

c) On the other end of the line, draw a line at an angle of 45° above the first line.

2D shapes:

Symmetry

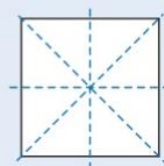
A **line of symmetry** is a **mirror line**, along which you can fold a shape so that both halves match up exactly. Either side of the line of symmetry is a **reflection** of the other.



Example 1

Draw the lines of symmetry on a square.

There are four ways you can fold this shape so that both halves match up exactly. The lines of symmetry are the fold lines.

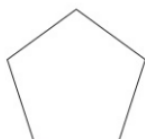


A square has 4 lines of symmetry.

Questions

1 Trace each of these shapes and draw on the lines of symmetry (if there are any). State the number of lines of symmetry each shape has.

a)



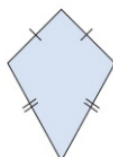
b)



c)



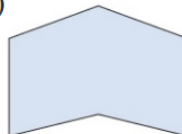
d)



e)

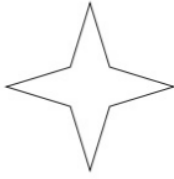


f)



- 2 Trace each of these shapes and draw on the lines of symmetry.
State the number of lines of symmetry each shape has.

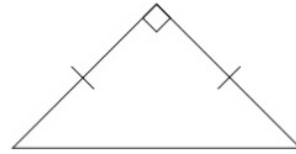
a)



b)

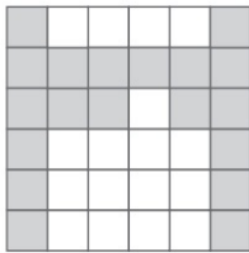


c)

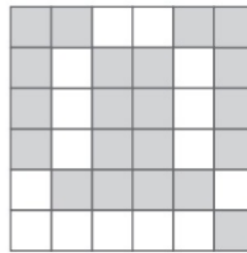


- 3 Copy each of these diagrams, then shade one more square on each to make a pattern with exactly 1 line of symmetry.

a)



b)



Drawing 2D shapes

When drawing a 2D shape you have to think about how you can describe it.

How many sides does it have?

How long are the sides?

How many angles or vertices does it have?

Does it have lines of symmetry?

Does it have parallel sides?

Be careful to measure accurately when you are drawing a 2D shape.

Question:

- 1) Draw a 2D shape that has 4 equal sides that are each 3 cm long and has 4 right angles.
What is this shape called?
- 2) Draw a rectangle with sides that are 2 cm and 6 cm.
- 3) Draw a triangle which has 2 sides both measuring 5 cm.