

Prime Numbers

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Only divisible by itself and 1.

Remember:
1 is not a prime number

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Square Numbers

| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 |
| 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 77 | 84 |
| 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 |
| 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 |
| 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 |
| 11 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 110 | 110 | 121 | 132 |
| 12 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 120 | 120 | 132 | 144 |

A number multiplied by itself produces a square number.

The opposite of a square number is a square root.

√

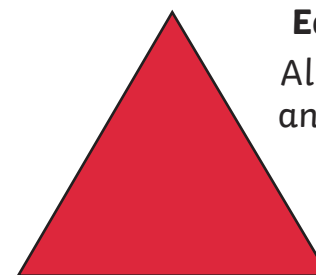
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Mean, Mode and Median

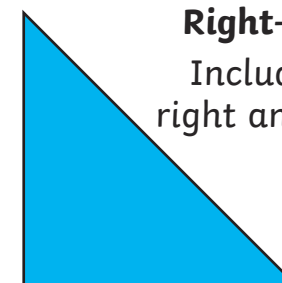
| | |
|---------------|---|
| Mean | The average when all values are added and then divided by the number of values. |
| Mode | The most popular number in a set of data. |
| Median | The middle value of a set of data when they are written in size order. |
| Range | The difference between the highest and lowest value of a set of data. |

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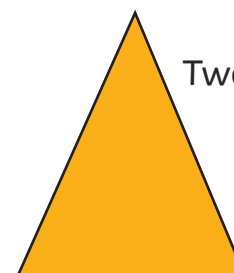
Triangles



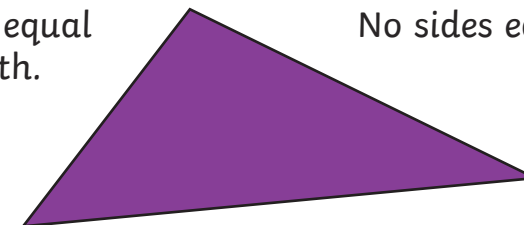
Equilateral
All sides and angles equal.



Right-Angled
Includes one right angle (90°)



Isosceles
Two sides equal in length.



Scalene
No sides equal.

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12 and 24 Hour Clock

| 12 Hour Clock | 24 Hour Clock |
|---------------|---------------|
| 12 midnight | 00:00 |
| 1am | 01:00 |
| 2am | 02:00 |
| 3am | 03:00 |
| 4am | 04:00 |
| 5am | 05:00 |
| 6am | 06:00 |
| 7am | 07:00 |
| 8am | 08:00 |
| 9am | 09:00 |
| 10am | 10:00 |
| 11am | 11:00 |

| 12 Hour Clock | 24 Hour Clock |
|---------------|---------------|
| 12pm | 12:00 |
| 1pm | 13:00 |
| 2pm | 14:00 |
| 3pm | 15:00 |
| 4pm | 16:00 |
| 5pm | 17:00 |
| 6pm | 18:00 |
| 7pm | 19:00 |
| 8pm | 20:00 |
| 9pm | 21:00 |
| 10pm | 22:00 |
| 11pm | 23:00 |

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Metric Measurements

Distance

| Unit | Symbol | Equivalent |
|------------|--------|------------|
| Kilometre | km | = 1000m |
| Metre | m | = 100cm |
| Centimetre | cm | = 10mm |
| Millimetre | mm | |

Volume

| Unit | Symbol | Equivalent |
|------------|--------|------------|
| Kilolitre | kl | = 1000l |
| Litre | l | = 100cl |
| Centilitre | cl | = 10ml |
| Millilitre | ml | |

Weight

| Unit | Symbol | Equivalent |
|-----------|--------|------------|
| Tonne | t | = 1000kg |
| Kilogram | kg | = 1000g |
| Gram | g | = 1000mg |
| Milligram | mg | |

Time

| Unit | Symbol | Equivalent |
|---------|--------|------------|
| Hour | H/h | = 60mins |
| Minute | mins | = 60secs |
| Seconds | secs | = 1000ms |

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Imperial Measurements

Distance

| Unit | Symbol | Equivalent |
|------|---------|------------|
| Mile | M | = 1760yds |
| Yard | yd | = 3' |
| Foot | ft or ' | = 12" |
| Inch | in or " | |

Volume

| Unit | Symbol | Equivalent |
|-------------|--------|------------|
| Gallon | gal | = 8pts |
| Quart | qt | = 2pts |
| Pint | pt | = 16floz |
| Fluid Ounce | floz | |

Weight

| Unit | Symbol | Equivalent |
|-------|--------|------------|
| Ton | t | = 160st |
| Stone | st | = 14lbs |
| Pound | lb | = 16oz |
| Ounce | oz | |

Area

| Unit | Symbol | Equivalent |
|-------------|-------------------|-----------------------|
| Square Mile | mile ² | = 640 acres |
| Acre | acre | = 4840yd ² |
| Square Yard | yd ² | = 9ft ² |
| Square Foot | ft ² | |

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Converting Units

'Kilo' means thousand and 'milli' means a thousandth

Metric Distance

| From | To | Method |
|------|----|--------|
| cm | m | ÷ 100 |
| cm | mm | × 10 |
| m | km | ÷ 1000 |
| km | m | × 1000 |

Metric Volume

| From | To | Method |
|------|----|--------|
| l | ml | × 1000 |
| ml | l | ÷ 1000 |

Imperial and Metric

| From | To | Method |
|-------|-------|--------|
| miles | km | × 1.6 |
| km | miles | ÷ 1.6 |

Metric Weight

| From | To | Method |
|------|----|--------|
| kg | g | × 1000 |
| g | kg | ÷ 1000 |

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Column Calculations

Commonly used for addition and subtraction.

Some tips to remember:

- Always work from right to left.
- Don't forget to add on any numbers you carry over to the next column.
- For subtractions the largest number is always on the top and it is always 'top take away bottom' as you work through.



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Shape Prefixes

Bi = 2

Hept = 7

Tri = 3

Oct = 8

Quad = 4

Non = 9

Pent = 5

Dec = 10

Hex = 6

Hemi = half

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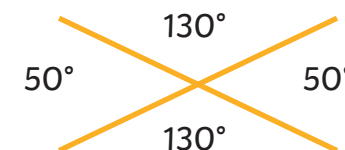
3D Shape Families

- **Quadrilaterals** all have 4 sides (square, rectangle, rhombus, parallelogram, trapezium).
- **Prisms** are like an elongated shape or a cylinder with edges, such as a hexagonal prism with hexagons on each end.
- **Pyramids** all have a base with the sides meeting at one point, such as a square-based pyramid or an octagonal-based pyramid.
- **Polygons** are 2D shapes that usually end in '-agon', such as octagon or nonagon.
- **Polyhedrons** are 3D shapes that usually end in '-hedron', such as octahedron or dodecahedron.

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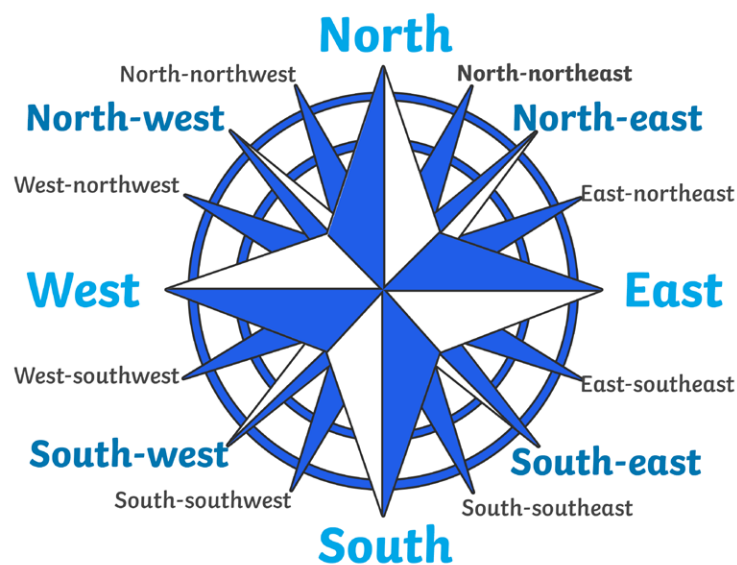
Angles

- Inside angles of a triangle = 180°
- Inside angles of a quadrilateral = 360°
- A straight line = 180°
- A full circle = 360°
- Opposite angles on crossing lines are equal, for example:



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Compass Points



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Multiplication Shortcuts

$\times 20 =$ double it then $\times 10$

$\times 30 =$ $\times 3$ then $\times 10$

$\times 4 =$ double, then double again

$\times 8 =$ double, double and double again.

$\times 15 =$ $\times 10$, half it, then add both together.

$\times 50 =$ $\times 100$, then half it.



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\times and \div by 10, 100 or 1000

\times move all digits to the left

\div move all digits to the right

$\times 10$ move all digits

1 place to the left

$\times 100$ move all digits

2 places to the left

$\times 1000$ move all digits

3 places to the left

$\div 10$ move all digits

1 place to the right

$\div 100$ move all digits

2 places to the right

$\div 1000$ move all digits

3 places to the right

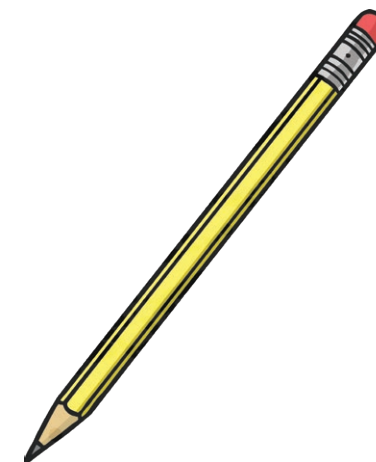
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Coordinates

The x axis goes across/horizontal

The y axis goes up/vertical

- Coordinates are written (x,y)
- The first number moves horizontally
- The second number moves vertically
- A useful tip is "along the corridor and up the stairs" (although the stairs may be down if you have negative numbers!).



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What is a Fraction?

$\frac{3}{4}$

The top number is called the numerator and tells you how many pieces you have out of the possible pieces.

The bottom number is called the denominator and tells you how many equal pieces something is cut into.

You use fractions all the time without thinking, like when you get $\frac{8}{10}$ on a spelling test. There are 10 equal marks available and you've got 8 of them.

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Comparing Fractions

Sometimes you will need to compare or calculate using fractions. The easiest way to compare them is to change them to a **common denominator** (same bottom number).

Do this by multiplying or dividing with the rule: do the same to the top as you do to the bottom.

So: $\frac{5}{12}$, $\frac{5}{6}$ and $\frac{3}{4}$ can all be made into 12ths by multiplying the 5 and the 6 by 2 and also the 3 and the 4 by 3 giving:
 $\frac{5}{12}$, $\frac{10}{12}$, $\frac{9}{12}$

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Finding Quick Percentages

Find 1% = $\div 100$

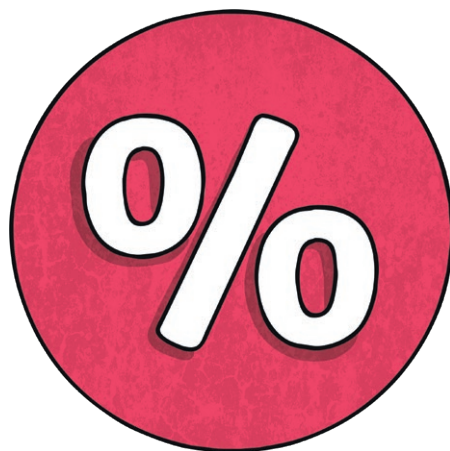
Find 10% = $\div 10$

Find 20% = $\div 5$

50% = $\div 2$

25% = $\div 4$

75% = $\div 4$, then $\times 3$



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Finding Any Percentage

Once you know that to find 1% is the same as dividing by 100, you can then multiply that by whatever percent you want!

For example 17% is 17 lots of 1%

So you will need to $\div 100$, then $\times 17$.

There are quick ways of finding some percentage such as 10% = $\div 10$, but even this long method would work the answer out correctly.



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Adding Fractions

1. Change them to a common denominator.
2. Add the top numbers only and keep the same denominator.

Example: $\frac{3}{4} + \frac{4}{6}$

1. Change both fractions to 12ths
 $= \frac{9}{12} + \frac{8}{12}$

2. Add the top numbers only and keep the bottom number:
 $9 + 8 = 17$

So the answer is $\frac{17}{12}$ or simplified to $1 \frac{5}{12}$

Subtracting Fractions

1. Change them to a common denominator.
2. Subtract the top numbers only and keep the same denominator.

Example: $\frac{3}{4} - \frac{4}{6}$

1. Change both fractions to 12ths
 $= \frac{9}{12} - \frac{8}{12}$

2. Subtract the top numbers only and keep the bottom number:
 $9 - 8 = 1$

So the answer is $\frac{1}{12}$

Multiplying Fractions

1. Multiply the two top numbers together to get a new top number.
2. Multiply the two bottom numbers together to get a new bottom number

Example: $\frac{3}{5} \times \frac{4}{6}$

1. Multiply the two top numbers together = $3 \times 4 = 12$
2. Multiply the two bottom numbers together = $5 \times 6 = 30$

So the answer is $\frac{12}{30}$

Which you can then simplify to $\frac{6}{15}$, $\frac{4}{10}$ or $\frac{2}{5}$

Dividing Fractions

1. Flip the second fraction over
2. Multiply the two top numbers together to get a new top number.
3. Multiply the two bottom numbers together to get a new bottom number.

Example: $\frac{3}{5} \div \frac{2}{7}$

1. Flip the second fraction over so it becomes $\frac{3}{5} \times \frac{7}{2}$
2. Multiply the two top numbers together $3 \times 7 = 21$
3. Multiply the two bottom numbers together $5 \times 2 = 10$

So the answer is $\frac{21}{10}$

Which you can then simplify to $2 \frac{1}{10}$

Roman Numerals

| | | |
|---------|----------|-----------------------------------|
| I = 1 | VI = 6 | L = 50 |
| II = 2 | VII = 7 | C = 100 |
| III = 3 | VIII = 8 | D = 500 |
| IV = 4 | IX = 9 | M = 1000 |
| V = 5 | X = 10 | $\overline{\text{M}}$ = 1 million |

A line over any letter makes it 1000 times bigger.

Decimals

A good tip with decimals is to think of them as money.

For example: $1.2 + 3.4$

could be thought of as: £1.20 + £3.40 giving an answer of £4.60 and it seems much easier.

Just don't forget to make it back into a plain decimal in the end.

So £4.60 would be 4.6



Times Table Square

| × | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|----|----|----|----|----|----|----|----|-----|
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Fractions, Decimals and %

| Fraction | Decimal | Percentage % |
|-----------------|---------|--------------|
| $\frac{1}{100}$ | 0.01 | 1% |
| $\frac{1}{10}$ | 0.1 | 10% |
| $\frac{1}{5}$ | 0.2 | 20% |
| $\frac{1}{2}$ | 0.5 | 50% |
| $\frac{1}{4}$ | 0.25 | 25% |
| $\frac{3}{4}$ | 0.75 | 75% |