MATHS 10-A-DAY

THE FOUR OPERATIONS

Addition +

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

Starting with the ones, add each column in turn. Regroup tens, hundreds, thousands, ten thousands as required.

Addition Vocabulary +

- add
- more
- plus
- increase
- total
- sum
- altogether

Subtraction −

	3	5	$^{6}\not{7}$	$^{13}\not{4}$	$^{1}2$
-		3	4	7	6
	3	2	2	6	6

Starting with the ones, subtract each column in turn. Exchange tens, hundreds, thousands and/or ten thousands as required.

Subtraction Vocabulary −

- subtract
- difference
- difference between
- less
- minus
- take away
- fewer

Long Multiplication ×

1	$\not{3}$	$\not{2}$	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

Start with the ones.

154 × 6 = 924

154 × 20 = 3080

3080 + 924 = 4004

Multiplication Vocabulary ×

- multiply
- multiplied by
- times
- lots of
- groups of
- repeated addition
- product

Short Division ÷

Start from the left.

		4	4	0	5
12	5	$^{5}2$	$^{4}8$	6	$^{6}0$

5 ÷ 12 = 0 r5

52 ÷ 12 = 4 r4

48 ÷ 12 = 4

6 ÷ 12 = 0 r6

Division Vocabulary ÷

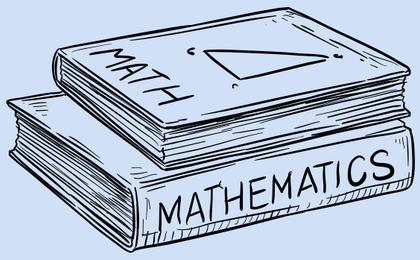
- divide
- divided by / divisible by
- divide into
- groups of
- shared
- share between
- how many go into

Long Division ÷

		1	2	0	r	3
14	1	6	8	3		
	−1	4	0	0		
		2	8	3		
	−	2	8	0		
				3		

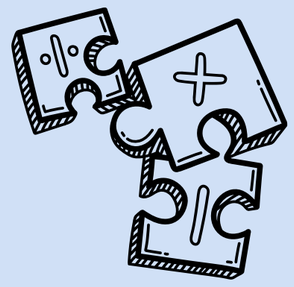
Division Vocabulary

- remainder
- left over



MATHS 10-A-DAY

MULTIPLICATION AND DIVISION VOCABULARY



Factor ÷

- A number that divides exactly into another number.
- All numbers have an even number of facts **except** square numbers which have an odd number.
- Example:
  - Factors of 12 = 1, 2. 3, 4, 6, 12
  - Factors of 9 = 1, 3, 9

Common factor ÷

- Factors of two numbers which are the same.
- Example:
  - Factors of 8 = **1, 2, 4**, 8
  - Factors of 12 = **1, 2**. 3, **4**, 6, 12
- Common factors of 8 and 12 = 1, 2 and 4.

Prime number PRIME

- A number with only two factors - itself and 1 (i.e. a number which can only be divided by itself and 1).
- 1 is NOT a prime number as it only has one factor.
- 2 is the only even prime number.

First 10 prime numbers = 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.

Prime factor PRIME

- A factor which is prime.
- Example: Factors of 12 = 1, 2. 3, 4, 6, 12
  - Prime factors of 12 = 2 and 3

Multiple ×

- A number in another number's times table.
- Example:
  - Multiples of 5 = 5, 10, 15, 20 etc.
  - Multiples of 9 = 9, 18, 27, 36 etc.

Common mutliple ×

- Multiples of two numbers which are the same.
- Example:
  - Multiples of 4 = 4, 8, 12, 16, 20, 24 etc.
  - Multiples of 6 = 6, 12, 18, 24, 30, 36 etc.
- Common multiples of 4 and 6 = 12, 24 etc.

Composite number

- A number with more than 2 factors.
- Example: 12 is a composite number as it has six factors (1, 2, 3, 4, 6 and 12).

Square number

- The result when a number is multiplied by itself (e.g. 2 x 2 = 4 which means that 4 is a square number).
- All square numbers have an odd number of factors.
- First 12 square numbers = 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121 and 144.

Cube number

- The result when a number is multiplied by itself 3 times (e.g. 2 x 2 x 2 = 8 which means that 8 is a cube number).
- First 5 cube numbers = 1, 8, 27, 64 and 125.

Square and cube notation

2^2 Squared

2^3 Cubed

MATHS 10-A-DAY

FRACTIONS

Adding Fractions +

- Find a common denominator (list multiples for each if unsure).
- Convert each fraction using the common denominator - remember, whatever you do to the bottom, you do to the top.
- Add the numerators (denominators stay the same).
- Simplify if you can.

Adding Fractions +

x3 x4

$$\frac{3}{4} + \frac{2}{3} = \frac{9}{12} + \frac{8}{12} = \frac{17}{12} = 1\frac{5}{12}$$

x3 x4

Subtracting Fractions −

- Find a common denominator (list multiples for each if unsure).
- Convert each fraction using the common denominator - remember, whatever you do to the bottom, you do to the top.
- Subtract the numerators (denominators stay the same).
- Simplify if you can.

Subtracting Fractions −

x2 x6

$$\frac{5}{6} - \frac{1}{2} = \frac{10}{12} - \frac{6}{12} = \frac{4}{12} = \frac{1}{3}$$

x2 x6

Multiplying Fractions ×

- Multiply the numerators together.
- Multiply the denominators together.
- Simplify if you can.

- If multiplying by an integer (whole number), put it over 1 first.

Multiplying Fractions ×

a). $\frac{4}{7} \times \frac{1}{3} = \frac{4}{21}$

b). $\frac{2}{5} \times 4 = \frac{2}{5} \times \frac{4}{1} = \frac{8}{5} = 1\frac{3}{5}$

Dividing Fractions ÷

- **Keep** the first fraction as it is.
- **Change** the divide to a times sign.
- **Flip** the second fraction so the denominator becomes the numerator.
- Simplify if you can.

- If dividing with an integer (whole number), put it over 1 first.

Dividing Fractions ÷

$$\frac{3}{7} \div \frac{1}{5} = \frac{3}{7} \times \frac{5}{1} = \frac{15}{7} = 2\frac{1}{7}$$

Fraction of an Amount ÷ ×

- Divide the whole by the denominator.
- Multiply your answer by the numerator.

Divide by the bottom, then times by the top

Fraction of an Amount ÷ ×

$\frac{2}{5}$ of 75 = 75 ÷ 5 = 15

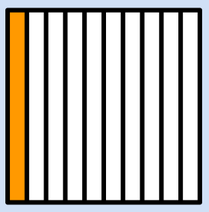
15 x 2 = 30

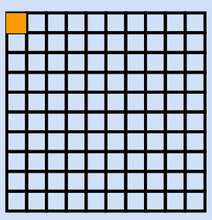
MATHS 10-A-DAY

PERCENTAGE OF AMOUNTS AND FRACTION, DECIMAL AND PERCENTAGE EQUIVALENTS

Percent

- Per **cent** (%) = 'out of 100'
- Whole = 100%



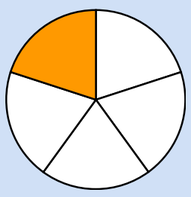


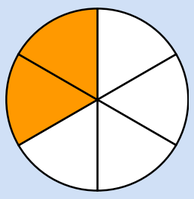
F	=	D	=	%
$\frac{1}{10}$		0.1		10%
$\frac{1}{100}$		0.01		1%

Finding 10%

- Divide by 10

÷10 (100% = £400 ; 10% = £40) ÷10



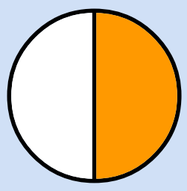


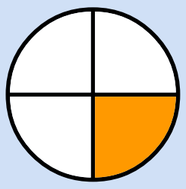
F	=	D	=	%
$\frac{1}{5} = \frac{2}{10}$		0.2		20%
$\frac{2}{5} = \frac{4}{10}$		0.4		40%

Finding 1%

- Divide by 100

÷100 (100% = £400 ; 1% = £4) ÷100



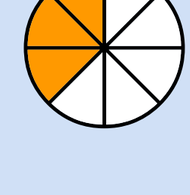


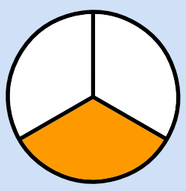
F	=	D	=	%
$\frac{1}{2}$		0.5		50%
$\frac{1}{4}$		0.25		25%

Finding 50%

- Divide by 2

÷2 (100% = £400 ; 50% = £200) ÷2



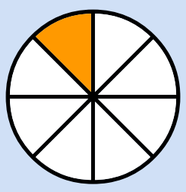


F	=	D	=	%
$\frac{3}{4}$		0.75		75%
$\frac{1}{3}$		$0.\dot{3}$		$33.\dot{3}\%$

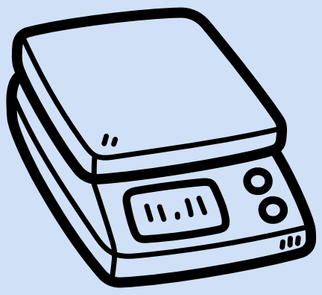
Finding 25%

- Divide by 4 (or half then half again)

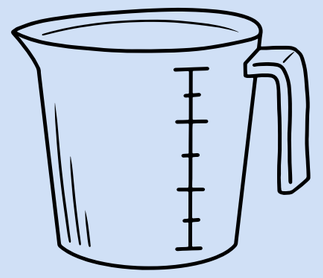
÷4 (100% = £400 ; 25% = £100) ÷4



F	=	D	=	%
$\frac{1}{8}$		0.125		12.5%
$\frac{3}{8}$		0.375		37.5%



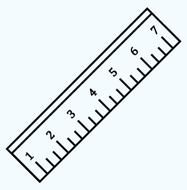
MATHS 10-A-DAY



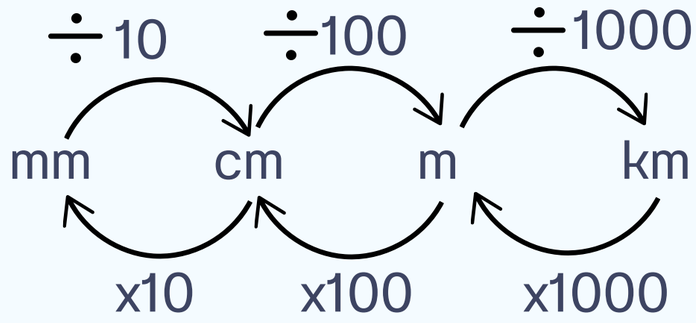
CONVERTING UNITS OF MEASURE

Conversions of length

- 10mm = 1 cm
- 100cm = 1m
- 1m = 1km



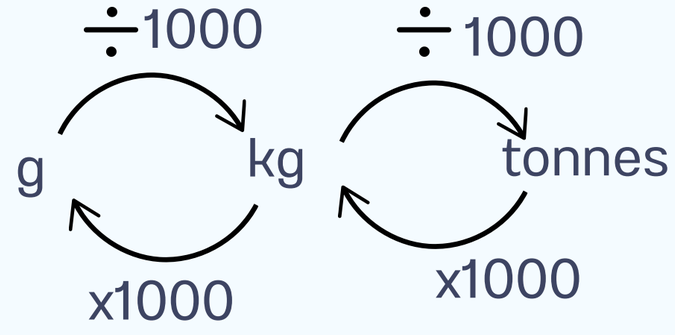
Converting units of length



Conversions of mass

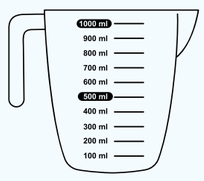
- 1000g= 1 kg
- 1000kg = 1 tonne

Converting units of mass

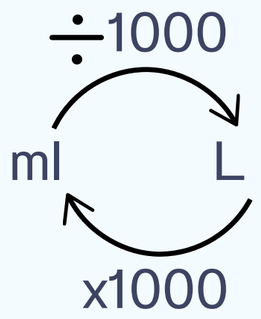


Conversions of capacity

- 1000ml = 1L



Conversions of capacity

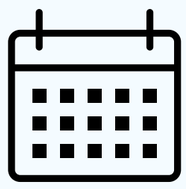


Conversions of time

- 60 seconds = 1 minute
- 60 minutes = 1 hour
- 24 hours = 1 day

Conversions of time

- 7 days = 1 week
- 4 weeks = 1 month
- 12 months = 1 year
- 52 weeks = 1 year

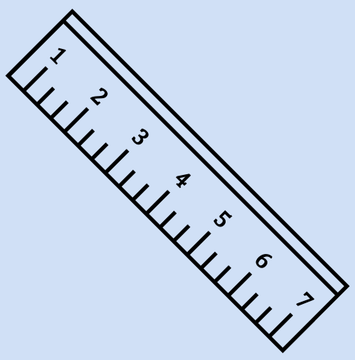


Key conversion facts

- 1mile = 1.6km
- 5 miles ≈ 8km

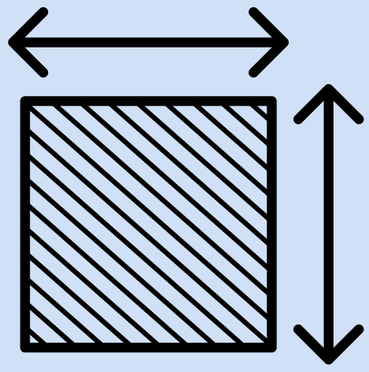
Key conversion facts

- Cent = 100
- Milli = 1000
- Kilo = 1000



MATHS 10-A-DAY

MEASUREMENT

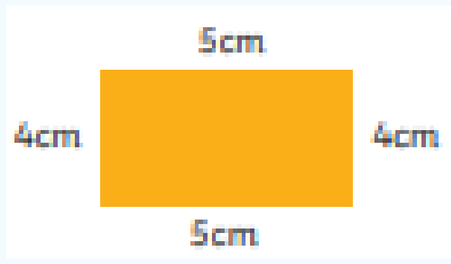


Perimeter

- The length all the way around the outside of a 2D shape.
- To calculate perimeter, add all sides together.
- Remember your unit of measurement for your answer.

Perimeter = length + width + length + width

Perimeter



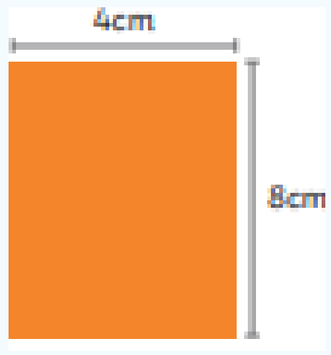
5 cm + 4cm + 5cm + 4cm = **18cm**

Area of a Rectangle

- The space inside the rectangle.
- Remember your unit of measurement for your answer. These are need ‘squared’ after them to show they represent the area.

Area of a rectangle = length x width

Area of a Rectangle



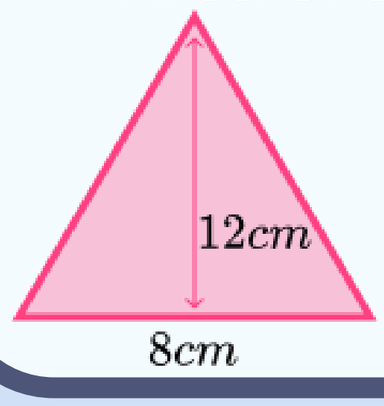
8cm x 4cm = **32cm²**

Area of a Triangle

- The space inside the triangle.
- The perpendicular height is used (perpendicular = at a 90° angle to the base).
- Remember your unit of measurement for your answer. These are need ‘squared’ after them to show they represent the area.

Area of a triangle =
(base x perpendicular height) ÷ 2

Area of a Triangle



8cm x 12cm = 96

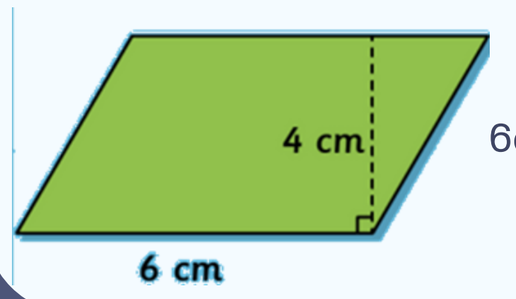
96 ÷ 2 = **48cm²**

Area of a Parallelogram

- The space inside the parallelogram.
- The perpendicular height is used (perpendicular = at a 90° angle to the base).
- Remember your unit of measurement for your answer. These are need ‘squared’ after them to show they represent the area.

Area of a parallelogram =
base x perpendicular height

Area of a Parallelogram



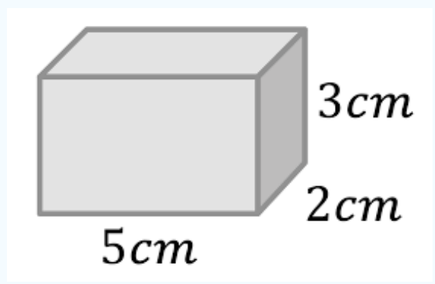
6cm x 4cm = **24cm²**

Volume of a Cuboid

- Volume is the amount of space a 3D shape takes up.
- Remember your unit of measurement for your answer. These are need ‘cubed’ after them to show they represent the volume.

Volume of a cuboid =
base x height x depth

Volume of a Cuboid

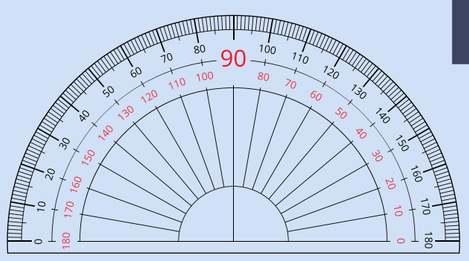


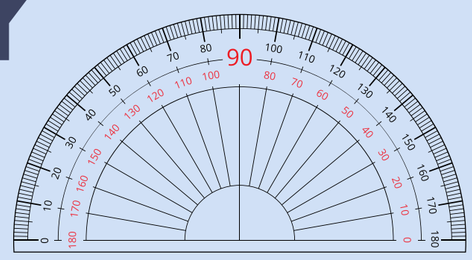
5cm x 3cm x 2cm

= **30cm³**

MATHS 10-A-DAY

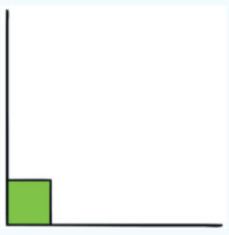
ANGLES





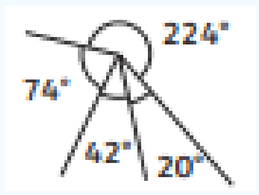
Right angle

- A right angle is **90°**.



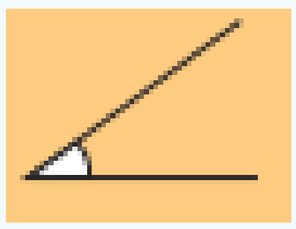
Angles around a Point

- Angles around a point add up to 360° because they create a **circle**.



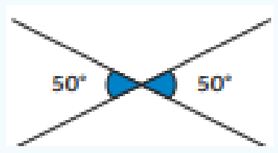
Acute

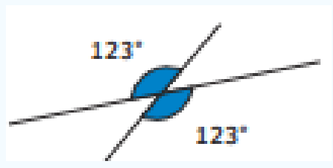
- Any angle that measures less than 90° is **acute**.



Vertically Opposite

- Angles opposite each other on a vertex are **equal**.



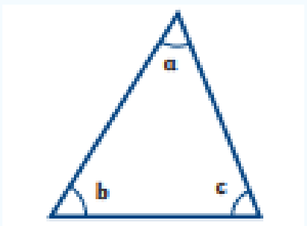


Obtuse

- Any angle that measures greater than 90° and less than 180° is **obtuse**.

Angles in a Triangle

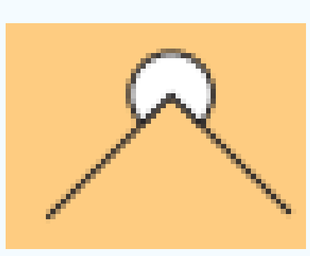
- Angles in a triangle add up to 180°.



$a + b + c = 180°$

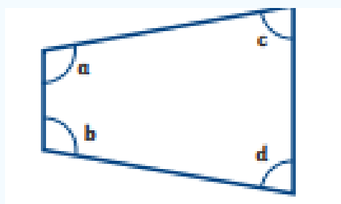
Reflex

- Any angle that measures greater than 180° is **reflex**.



Angles in a Quadrilateral

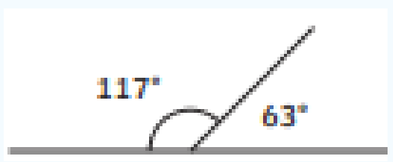
- Angles in a quadrilateral add up to 360°.



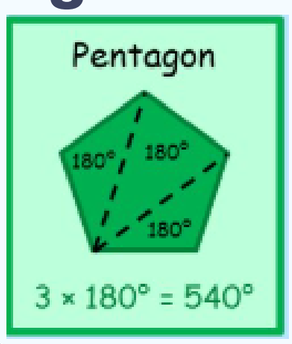
$a + b + c + d = 360°$

Angles on a Straight Line

- Angles on a straight line add up to 180°.



Angles in a Regular Polygon



- To work out the sum of the interior angles in a regular polygon, split the shape into triangles.
- Remember that the angles in a triangle = 180°