



# **M**aths

## Formula Booklet

# Level **2**

## Functional Skills

## BIDMAS

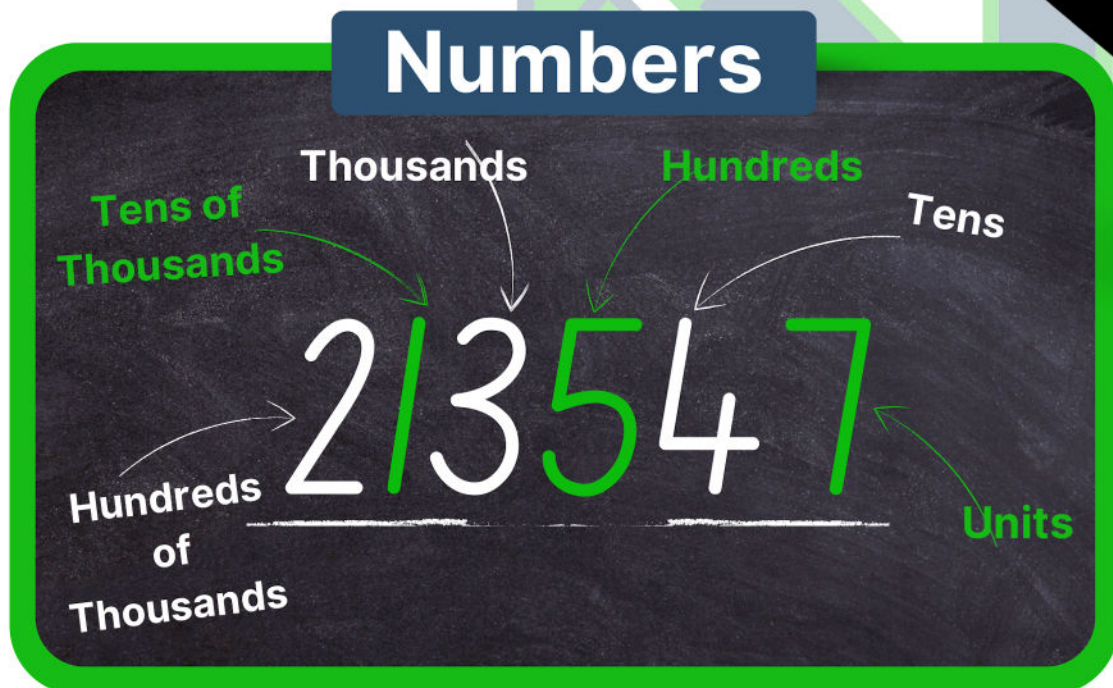
**B**rackets  
**I**ndices  
**D**ivision  
**M**ultiplication  
**A**ddition  
**S**ubtraction

## Square Numbers

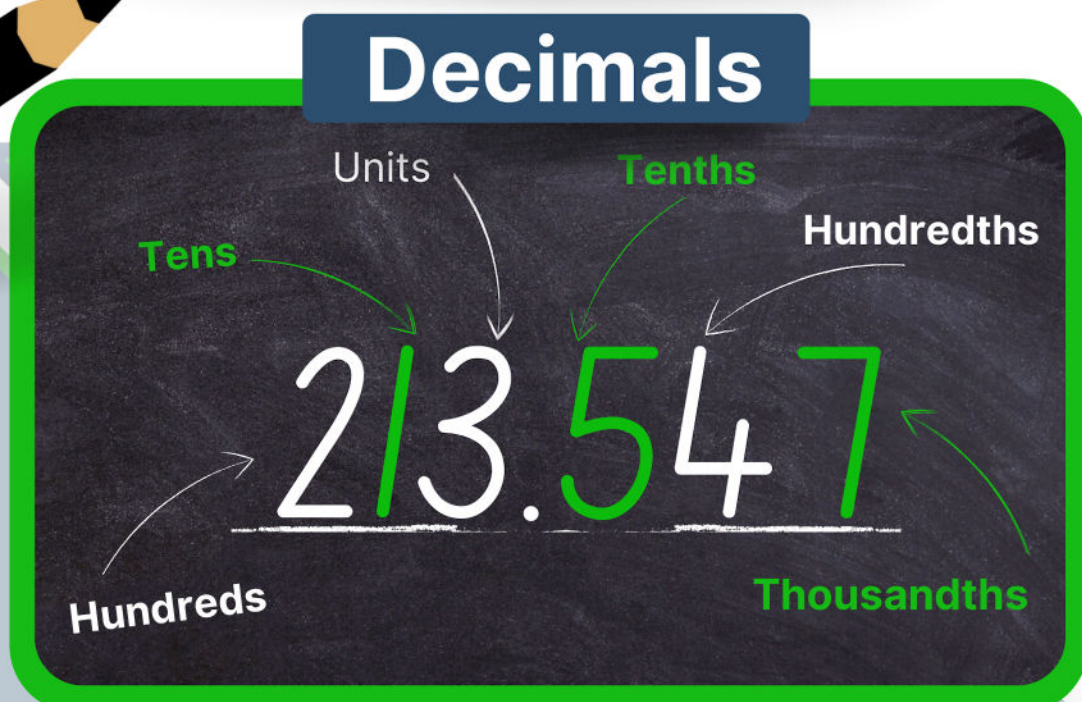
The square of a number, written as  $n^2$ , is itself multiplied by itself.

**Example:**  $5^2 = 5 \times 5 = 25$

## Numbers



## Decimals





# DON'T FORGET

## Percentages

15% of =  $\times 0.15$   
15% increase =  $\times 1.15$   
15% decrease/discount  
=  $\times 0.85$   
(because  $100 - 15 = 85$ )

## Key Conversions

Money:

£1 = 100p

1 minute = 60  
seconds

1 hour = 60  
minutes

1 day = 24 hr

1 week = 7 days

Time:

1 year = 365 days

1 year = 12  
months

1 decade = 10  
years

1 century = 100  
years

## Formulas

Some questions give  
you a formula to use.

Example:

Time taken to wash car (mins)  
=  $30 + 2 \times \text{surface area of car (m}^2\text{)}$

Suppose we have a car with a  
surface area of  $25\text{m}^2$ .

How long does it take to wash?

Time =  $30 + 2 \times 25 = 80$  mins

Length:

1 cm = 10 mm

1 m = 100 cm

1 km = 1000 m

Capacity:

1 ml =  $1\text{ cm}^3$

1 L = 1000 ml

Weight:

1 kg = 1000 g



## Compound Interest


5% interest of £100 for 3 years:

$$\text{Total} = 100 \times 1.05 \times 1.05 \times 1.05 = \text{£}115.76$$

## Angles

Sum of angles in triangle =  $180^\circ$



 Sum of angles in quadrilateral =  $360^\circ$

## Mean and Range

Mean = 
$$\frac{\text{Sum of all values}}{\text{Number of all values}}$$

Range = 
$$\text{Highest value} - \text{Lowest value}$$

## Probability

Probability of event = 
$$\frac{\text{Number of outcomes in event}}{\text{Total number of outcomes}}$$

Probability of event not happening = 
$$\frac{1 - \text{probability of event}}$$

Probability of event happening n times = 
$$(\text{Probability of event})^n$$

## Estimating the Mean

Estimate of mean = 
$$\frac{\text{Sum of frequency} \times \text{midpoint}}{\text{Sum of frequency}}$$



DON'T FORGET

distance = speed  $\times$  time

speed = distance  $\div$  time

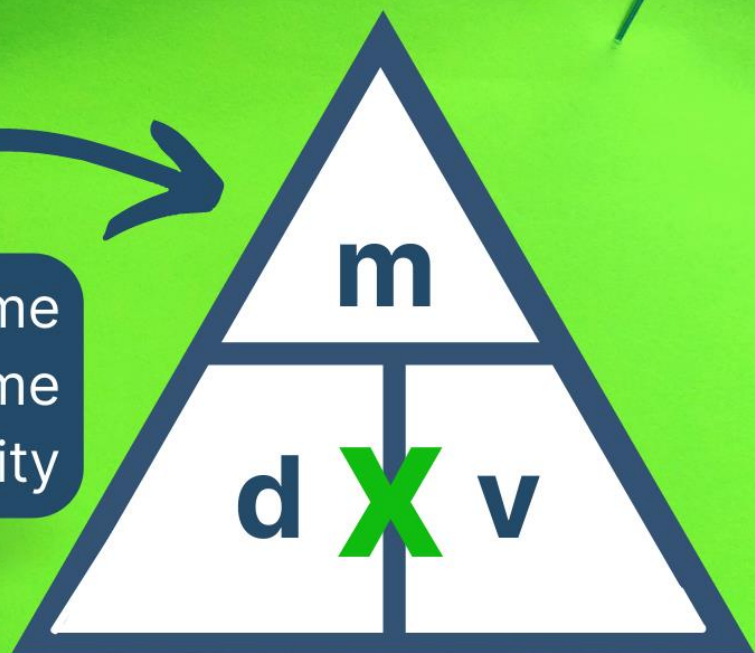
time = distance  $\div$  speed



mass = density  $\times$  volume

density = mass  $\div$  volume

volume = mass  $\div$  density



TURN ME  
OVER!

# Perimeter

$$\text{Square} = 4a$$

$$\text{Rectangle} = 2(a+b)$$

$$\text{Equilateral triangle} = 3a$$

$$\text{Isosceles triangle} = 2a+b$$

$$\text{Scalene triangle} = a+b+c$$

$$\text{n-sided regular polygon} = na$$

$$\text{Circle} = \pi d = 2\pi r$$

## Area

$$\text{Square} = a^2$$

$$\text{Rectangle} = ab$$

$$\text{Triangle} = \frac{1}{2}bh$$

$$\text{Circle} = \pi r^2$$

## Volume

$$\text{Cube} = a^3$$

$$\text{Cuboid} = abc$$

$$\text{Prism} = \text{length} \times \text{cross-sectional area}$$

$$\text{Cylinder} = \pi r^2 h$$

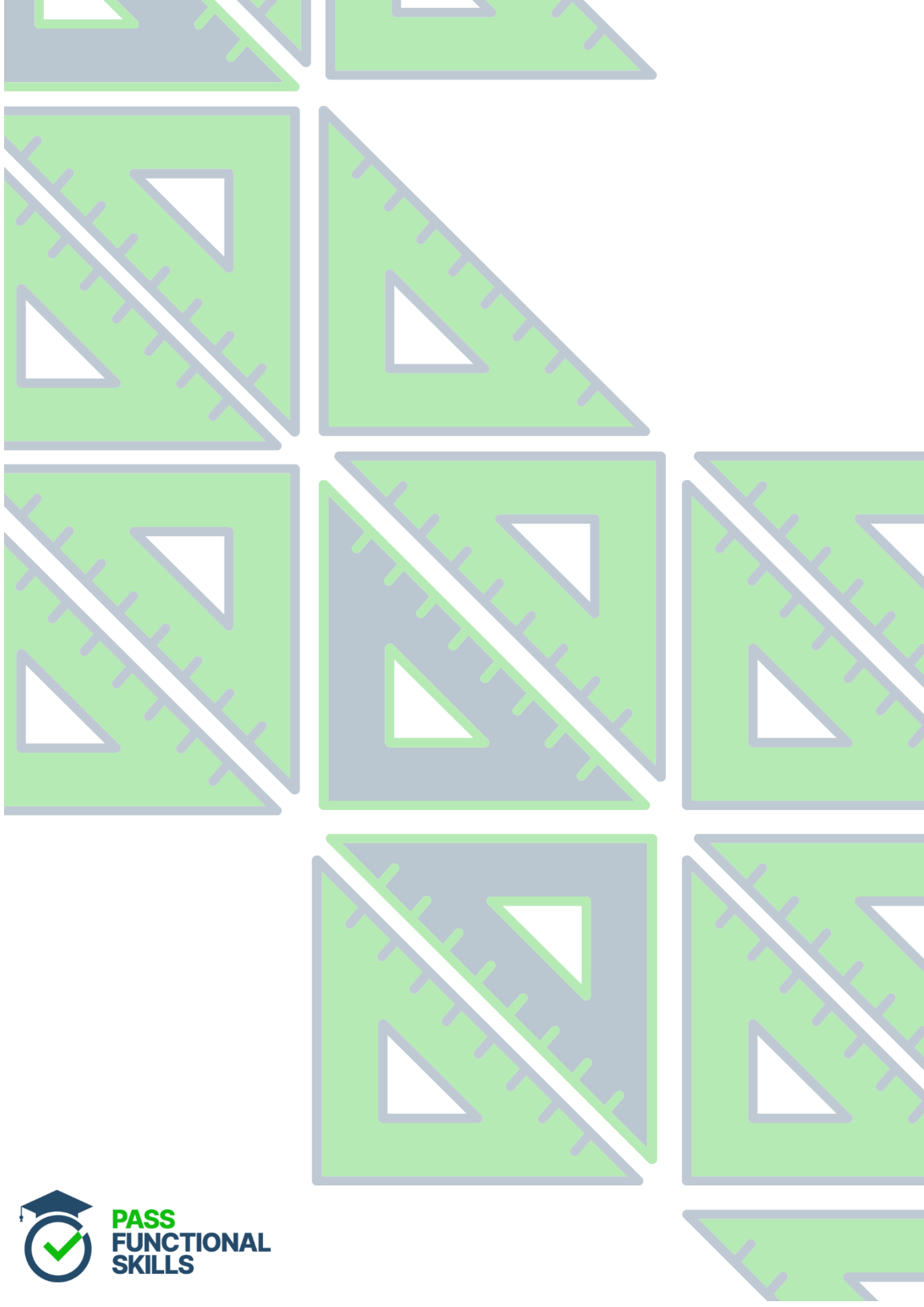
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# Common Fractions, Decimals and Percentages

Fraction	Decimal	Percentage
1	1	100%
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{3}{4}$	0.75	75%
$\frac{1}{5}$	0.2	20%
$\frac{2}{5}$	0.4	40%
$\frac{3}{5}$	0.6	60%
$\frac{4}{5}$	0.8	80%
$\frac{1}{10}$	0.1	10%
$\frac{1}{100}$	0.01	1%

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**PASS**  
**FUNCTIONAL**  
**SKILLS**