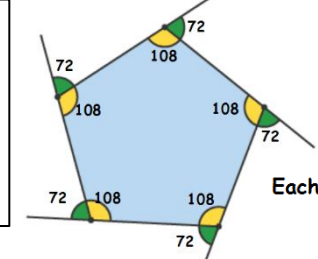


Square root
 $2 \times 2 = 2^2 = 4$
 Therefore $\sqrt{4} = 2$

Cube root
 $3^3 = 3 \times 3 \times 3 = 27$
 Therefore $\sqrt[3]{27} = 3$

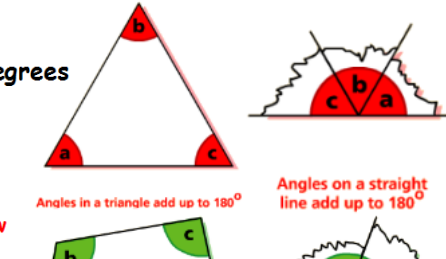


ALL exterior - add up to 360 degrees

Each interior angle = Total interior + number of sides
 $= 540^\circ + 5 = 108^\circ$

interior + exterior = 180 degrees

To find, number of sides if you know exterior angle
 number of sides = $360 \div \text{exterior angle}$



m = The gradient or slope c is called the y intercept

$y = mx + c$

wholes $2 + 1 = 3$

parts $\frac{1}{5} + \frac{1}{4} = \frac{4}{20} + \frac{5}{20} = \frac{9}{20}$

When multiplying different signs give you - same signs give you +

$(-2)^2 = -2 \times -2 = 4$
 $(-3)^3 = -3 \times -3 \times -3 = -27$

Triangular numbers

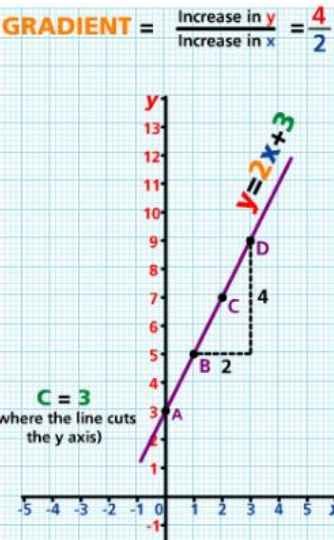
1 = 1
 1+2 = 3
 1+2+3 = 6
 1+2+3+4 = 10

Square numbers

1 = 1
 4 = 2x2
 9 = 3x3
 16 = 4x4

Total interior angles = $(n-2) \times 180^\circ$
 $= (5-2) \times 180^\circ = 3 \times 180^\circ = 540^\circ$

where n is number of sides



Plotting the graph of $y = 2x + 3$

x	0	1	2	3
2x	0	2	4	6
+3	+3	+3	+3	+3
y	3	5	7	9

Plot (0,3), (1,5), (2,7), (3,9)

Check: straight line?

Divide $\frac{2}{5} \div \frac{1}{2} = \frac{2}{5} \times \frac{2}{1} = \frac{4}{5}$

Keep Flip Change

$\frac{9}{4} = 2 \frac{1}{4}$ remainder

$3 \frac{2}{5} = \frac{17}{5}$ Denominator

Sue and Jane share sweets in ratio of 2:9

i) What fraction of the sweets does Jane receive?
 2:9 add 2+9=11
 as a fraction $\frac{2}{11} : \frac{9}{11}$ Jane receives $\frac{9}{11}$

ii) Share £44 in the ratio of 2:9

2:9
 2+9=11
 $\frac{£44}{11} = 4$
 multiply ratio by 4
 x4 2:9 x4
 £8: £36
 check: 8+36 = £44 as asked

A length x , rounded to nearest 100's, 500cm.
 Write down the error interval.
 $450 \leq 500 < 550$

A number y , rounded to 1 decimal place is 3.1
 Write down range of numbers
 $0.1's + 2 = 0.05$ so add and subtract 0.05 to 3.1
 $3.05 \leq 3.10 < 3.15$

1 pint \approx 0.5 ltr
 1 gallon \approx 4.5 ltr
 1000ml = 1 Litre
 1000g = 1kg

10mm = 1cm
 100cm = 1m
 1000m = 1km
 1mile = 1.6 km
 8km = 5 miles
 1 inch = 2.5 cm
 1 foot = 30 cm

Pythagoras theorem $a^2 + b^2 = c^2$ (hypotenuse)

side $a=8$, $b=15$, $c=?$

$\sqrt{8^2 + 15^2} = 17\text{cm}$

Alternate angles (Z) are the same ZALT

Corresponding angles (FCORE) are the same

Co-interior angles (C) angles add up to 180

Trigonometry ratios

Sine / cos / tan
 SOH CAH TOA

H for Hypotenuse
 O for OPPOSITE
 A for Adjacent

OPP HYP

Craig goes on holiday to Hong Kong. In Hong Kong, he sees a camera costing HK\$3149.55. In London, an identical camera costs £280. The exchange rate is £1 = HK\$12.30. Craig buys the camera in Hong Kong. How much cheaper is the camera in Hong Kong than in London?

£1 = HK\$ 12.30
 $\times 280 = \text{HK\$ } 3444$ uk price
 Cheaper in Hong Kong

OR
 $\text{HK\$ } 3149.55 = \text{£ } 256.06$
 $\text{HK\$ } 3149.55 = \text{£ } 256.06$ uk price
 Cheaper in Hong Kong

GCSE FOUNDATION 5-1

Pie chart - NON-CALCULATOR

- Total all the data
- $360 \div \text{total} = \text{each person's angle}$
- each person's angle x data frequency
- each = $360 \div 40 = 9^\circ$ degrees

Colour	Red	Blue	Green	Other	total
No. of People	20	10	3	7	40

Angles 180° 90° 27° 63°

Plain	46	$\frac{46}{144} \times 360 = 115^\circ$
Chicken	16	$\frac{16}{144} \times 360 = 40^\circ$
Salt & Vinegar	22	$\frac{22}{144} \times 360 = 55^\circ$
Cheese & Onion	26	$\frac{26}{144} \times 360 = 65^\circ$
Smokey Bacon	34	$\frac{34}{144} \times 360 = 85^\circ$
Total	144	360°

Linear sequence - nth term

1st 2nd 3rd 4th
 2 3, 8, 13, 18

Hint: D I N O Difference N
 Oth term

RULE 5N-2

Find 20th term = $5n - 2 = 5 \times 20 - 2 = 100 - 2 = 98$

Is 204 on this sequence? $5n - 2 = 204$
 $5n = 206$
 $n = 41.2$
 No! Not on this sequence as not a whole number

Recipe - CALCULATOR

Ingredients for 18 mince pies: 225g of butter, 350g of flour, 100g of sugar, 280g of mincemeat, 1 egg

Elaine wants to make 45 mince pies. 1 kg of butter, 1 kg of flour, 500g of sugar, 600g of mincemeat, 6 eggs

For 6 people: 300g of Sugar, 250g flour, 2 eggs

For 9 people: 450g of Sugar, 375g flour, 3 eggs

PROBLEM SOLVING

I am going to UNPACK these Maths Problems!

UNderline important information in the question.
 UNderstand what the question is asking me.
 What maths/Processes will I be using?

My Answer to the question.
 Have I Checked my work?
 I Know my answer makes sense.

Percentages

on a calculator: $39\% \text{ of } 82 = 0.39 \times 82$

without a calculator: 50% - half, 25% - half and half, 75% - 50% + 25%

increasing: 12% of 60 = $0.12 \times 60 = £7.20$
 New amount = $£60 + £7.20 = £67.20$

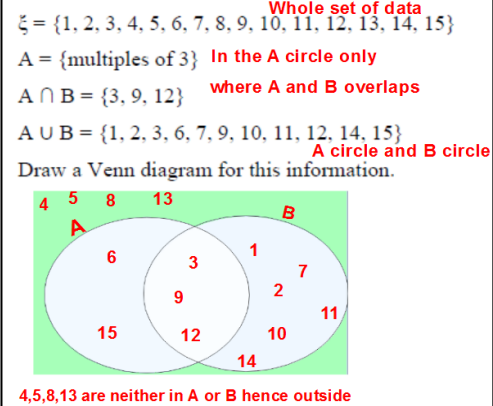
decreasing: decrease £60 by 12%
 New amount = $£60 - £7.20 = £52.80$

Remember, with money
 $£103 \div 3 = £34.333$
 round to 2d.p $£34.33$

Remember, with money
 $49p = £0.49$
 $2040p = £20.40$

Compound interest - CALCULATOR

John invests £220 in a bank account which has a yearly 7% interest rate. How much money will he have after 3 years?
 $= 220 \times 1.07^3 = 269.509 = £269.51$
 $1.00 + 7\% \text{ increase} = 1.07$



Kian wants to survey 30 pupils from year 7, 8 and 9 about their opinions on school uniform.

Year	7	8	9
Number of students	80	70	90

He says picking 20 students from year 8 will be a good representation. Is he right?
 adding up all the students $80 + 70 + 90 = 240$
 year 8 there are 70 out of 240.

year 8 = $\frac{70}{240} \times 30 = 8.75 \approx 9$

No. Kian needs to choose about 9 students

ABCD is a parallelogram.

Opposite angles in a parallelogram are equal
 $2x + 36 = 3x - 5$
 $-2x$ from both sides $36 = x - 5$
 $+5$ to both sides $41 = x$

Co-interior angles add up to 180
 $5y - 13 + 3x - 5 = 180$
 use $x = 41$
 $5y - 13 + 3(41) - 5 = 180$
 $5y - 13 + 123 - 5 = 180$
 add all the numbers $5y + 105 = 180$
 $5y = 75$
 $y = 15$

Area of sector

$A = \pi r^2$
 $135 \times \pi \times 5^2 = 29.45243... \text{cm}^2 = 29.45 \text{cm}^2$

$C = \pi d$
 Arc length = $\frac{135}{360} \times \pi \times 10 = 11.780972... = 11.78 \text{cm}$

Perimeter = $5\text{cm} + 5\text{cm} + \text{arc length} = 21.78 \text{cm}$

Mr Smith works out the cost of the gas he used last year. At the start of the year, the meter reading was 8259 units. At the end of the year, reading was 9854 units.

Each unit of gas he used cost 41p.
 Work out the total cost of the gas he used.
 end 9854 units start 8259 units
 $9854 - 8259 = 1595$ units used
 Total cost = $1595 \times 0.41 = £653.95$

$2^0 = 1$ $a^0 = 1$ power of zero = 1

$2^{-2} = \frac{1}{2^2} = \frac{1}{4}$ $a^{-2} = \frac{1}{a^2}$ Positive power

$a^{\frac{1}{2}} = \sqrt{a}$ square root
 $25^{\frac{1}{2}} = \sqrt{25} = 5$

$a^{\frac{1}{3}} = \sqrt[3]{a}$ cube root
 $27^{\frac{1}{3}} = \sqrt[3]{27} = 3$

Greg is 5 years older than Sam.
 Carol is twice the age of Sam.
 Their total age is 45. Find Sam's age.
 Sam is mentioned twice.

Let Sam's age = y Greg = $y + 5$ Carol = $2y$

Total = $y + y + 5 + 2y = 45$
 $4y + 5 = 45$
 -5
 $4y = 40$
 $\div 4$
 $y = 10$

REVERSE PERCENTAGES

In a sale, normal prices are reduced by 15%. The sale price of a CD player is £204. Work out the normal price of the CD player.

$100\% - 15\% = 85\%$
 $85\% = £204$
 $1\% = \frac{£204}{85} \times 100 = £240$

Reverse % = $\frac{\text{new amount} \times 100}{\text{new \%}}$