

GCSE Maths Assessment Practice topics

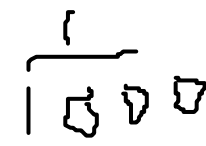


Contents

- Decimals and place value
- Four rules (+, -, × and ÷)
- Rounding
- Powers
- BIDMAS
- Directed Numbers
- Factors and Multiples
- Fractions
- Ratio
- Percentages
- Averages and Range
- Angles
- Graphs
- Metric measurement
- Symmetry
- Speed and Time
- Substitution
- Simplifying



Decimals



BILLIONS			MILLIONS			THOUSANDS			ONES			DECIMALS			
100	10	1	100	10	1	100	10	1	100	10	1	tenths	hundredths	thousandths	ten-thousandths
					4	5	7	8	0	3	2				
						3	0	5	0	4	2	3	0	5	

4578032 ¢

00305042.305000

3 0 5 0 4 2 . 3 0 5



Four Rules

• 36×27

$$\begin{array}{r} 36 \\ \times 27 \\ \hline 252 \\ 720 \\ \hline 972 \end{array}$$

$= 972$

• $291 \div 3$

$$\begin{array}{r} 97 \\ 3 \overline{) 291} \\ \underline{27} \\ 21 \\ \underline{21} \\ 0 \end{array}$$

• $23.4 + 37.83$

$$\begin{array}{r} 23.40 \\ + 37.83 \\ \hline 61.23 \end{array}$$



Rounding (10,100,1000 etc.)

- Round 35487 to the nearest 10, 100, 1000 etc.

35490 35500 35000

- Round 24983.72 to the nearest 10, 100, 1000 etc.

24980 25000 25000



Basic Powers

• 5^2 $5 \times 5 = 25$

$\sqrt{25} = 5$ or -5 ± 5

1, 4, 9, 16

• 5^3 $5 \times 5 \times 5 = 125$

$\sqrt[3]{125} = 5$

1, 8, 27, 64

• 5^4 $5 \times 5 \times 5 \times 5 = 625$



BIDMAS (order of operations)

• a) $3 + 22 - 1 = 24$

f) $10 + 22 \div 2 = 21$

• b) $(5 + 2)^2 \times 2 = 98$

g) $28 - 4 \div 2 = 26$

• c) $12 - 5 \times 2 = 2$

h) $3 \times 12 \div 4 = 9$

• d) $7 - (2 + 3)^2 = -18$

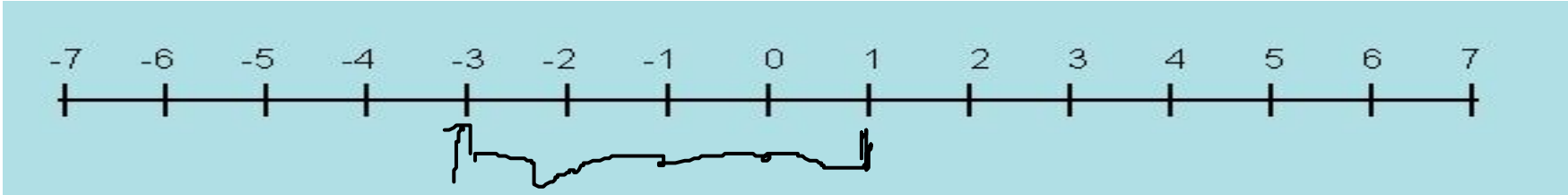
i) $(6 + 5) \times 3 = 33$

• e) $4 + 4 \times 5 = 24$

j) $(10 - 2) \times 5 = 40$



Directed Numbers (positive and negative)



What is $3 - 4$? -1

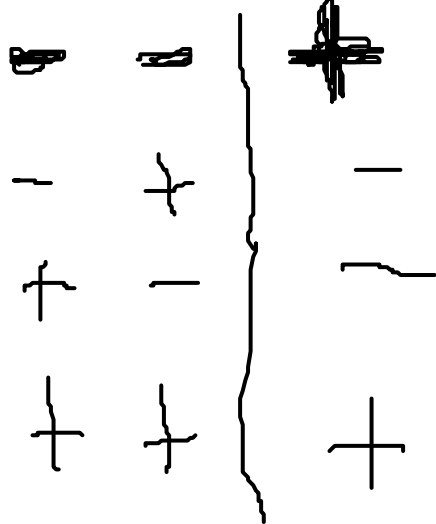
What is $-3 - 4$? -7

What is $3 - (-4)$? 7

What is $-3 - (+4)$? -7

What is $-3 - (-4)$? 1

Signs together



Factors and Multiples

- Factors of 8 1, 2, 4, 8
- Factors of 12 1, 2, 3, 4, 6, 12
 HCF = 4
- Multiples Of 4 4, 8, 12, 16
- Multiples of 6 6, 12, 18, 24 LCM = 12



Fractions

• $\frac{3}{8} = \frac{9}{?} = \frac{?}{40}$

Handwritten annotations:
- An arrow from 3 to 9 is labeled $\times 3$.
- An arrow from 8 to 40 is labeled $\times 5$.
- A bracket above the first two fractions is labeled $\times 3$.
- A bracket below the last two fractions is labeled $\times 5$.

$$\frac{9}{24} = \frac{15}{40}$$

• $\frac{3}{5} + \frac{3}{8} = \frac{24}{40} + \frac{15}{40} = \frac{39}{40}$

Handwritten annotations:
- An arrow from 5 to 40 is labeled $\times 8$.
- An arrow from 8 to 40 is labeled $\times 5$.



Ratio

- Simplify 10 apples : 15 oranges

$$2a : 3o$$

$$\frac{2}{5} \text{ or } \frac{10}{25}$$



If Squash is 3 parts juice to 10 parts water 3:10

- How much water would you add to 12cl of juice?

$$3p : 12cl$$

$$1p : 4cl$$

$$10 \text{ parts} = 10 \times 4 = 40cl$$

- How much juice is in 78cl of squash? $3 + 10 = 13p$

$$13p : 78cl$$

$$1p : 6cl$$

$$3p = 3 \times 6 = 18cl$$



Percentages

- What is 20% as a fraction and as a decimal

$$\frac{20}{100} = \frac{2}{10} = \frac{1}{5}$$

$$20\% = 0.2$$

- What is 20% of £280?

$$10\% = \text{£}28$$

$$20\% = \text{£}56$$

$$\frac{20}{100} \times \frac{280}{1} = \frac{56}{1} = \text{£}56$$

- Reduce £60 by 30%

$$10\% = \text{£}6$$

$$30\% = \text{£}18$$

$$= 60 - 18 = \text{£}42$$



Averages and Range

- Find the mean, median, mode and range of 5, 7, 2, 7 and 3

$$\text{Mean} = \frac{5 + 7 + 2 + 7 + 3}{5} = \frac{24}{5} = 4 \frac{4}{5}$$

$$\text{Mode} = 7$$

$$\text{Median} = 2, 3, \textcircled{5}, 7, 7 = 5$$

$$\text{Range} = 7 - 2 = 5$$

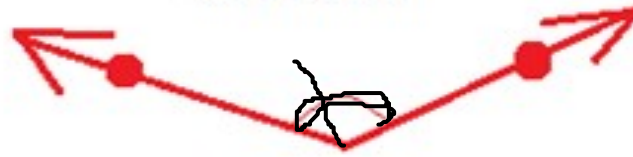


Angles

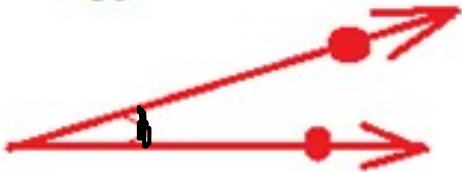
straight angle
 $= 180^\circ$



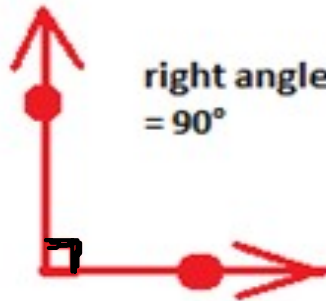
obtuse angle
 $90^\circ < v < 180^\circ$



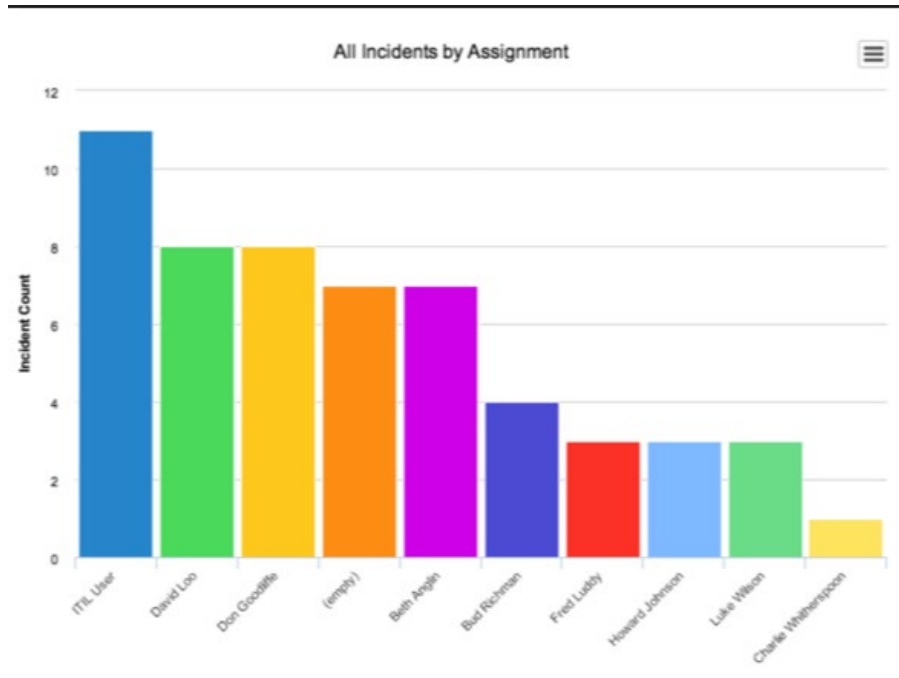
acute angle
 $< 90^\circ$



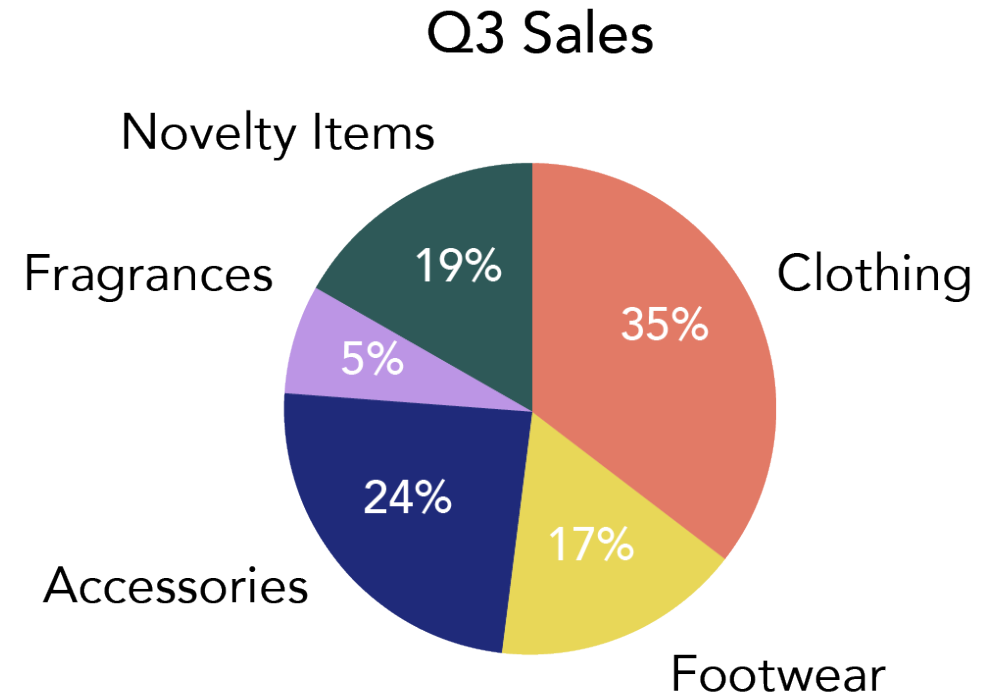
right angle
 $= 90^\circ$



Graphs



Incident



Metric



Length

Central unit is the Metre(m)

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ m} = 1000 \text{ mm}$$

$$1 \text{ km} = 1000 \text{ m}$$

Capacity

Central unit is the Litre(l)

$$1 \text{ l} = 100 \text{ cl}$$

$$1 \text{ l} = 1000 \text{ ml}$$

$$1 \text{ kl} = 1000 \text{ l}$$

- What is 384cm in metres?

$$3.84 \text{ m}$$

- What is 3.2 kg in grams?

$$3200 \text{ g}$$

- What is 376mm + 182cm + 2.3m?

$$37.6 + 182 + 230 = 449.6 \text{ cm}$$

Weight

Central unit is the Gram(g)

$$1 \text{ g} = 100 \text{ cg}$$

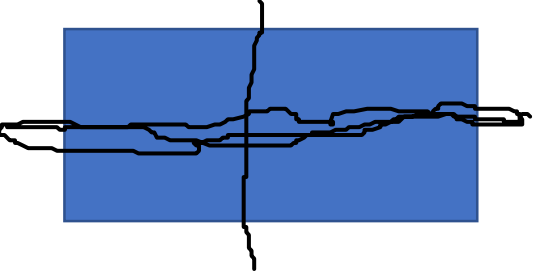
$$1 \text{ g} = 1000 \text{ mg}$$

$$1 \text{ kg} = 1000 \text{ g}$$

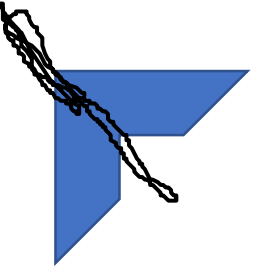


Symmetry

• 1



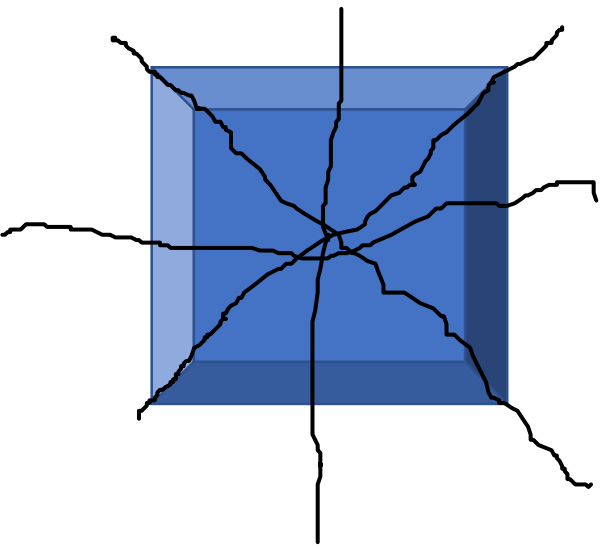
2



• 3



4



Speed and Time




- What is the Time between 2.48pm and 5.18pm

$$12m + 2h + 18m = 2h 30m$$

- How fast am I going on average if I travel 28km in 4 hours?

km/h


$$\frac{28}{4} = 7 \text{ km/h}$$

- How far do I go in 3hrs 15mins at 40km/h

$$40 \times 3\frac{1}{4} = 130 \text{ km}$$

- How long does it take to do 38km at 8km/h

$$\frac{38}{8} = \frac{19}{4} = 4\frac{3}{4} = 4h 45 \text{ mins}$$



Substitution

- If $x = 5$, $y = 3$ and $z = -2$ then what are the values of

- $2x - y$ $2 \times 5 - 3 = 7$

- x^2y 75

- $2z - 3x$ $-4 - 15 = -19$

- $3x - 2z$ $15 - 2 \times (-2) = 19$



Simplifying 1 Adding and Subtracting (Collecting like terms)

- $5x + 3x$

$$8x$$

- $8x - y - 5x - 3y$

$$3x - 4y$$

- $7x^2 - 8y - 11x^2 + y$

$$-4x^2 - 7y$$



Simplifying 2 Multiplying

- $3y \times 2y$ $3 \times 2 \times y \times y = 6y^2$

- $5x^3y \times 3xy^2$ $15x^4y^3$

- $(4a^2)^3$ $4a^2 \times 4a^2 \times 4a^2 = 64a^6$

