NUMBER

RBW

ROUNDING AND ESTIMATION

Write the following numbers to 3 significant figures.

1. 1234500

2. 4388.23

3. 0.725534

Write the following correct to 2 decimal places

5. 23.2467

6. 2.23455

7. 0.135

Show how to APPROXIMATE or ESTIMATE the following calculations

1. 52.1×27.3

2. $\dfrac{41 \times 68}{121}$

3. $\dfrac{4.02 \times 6.95}{2.03}$

4. $\dfrac{42.6 + 46.8}{78.6 - 47.5}$

5. $6.3 \div (2.4 - 0.91)$

UPPER AND LOWER BOUNDS

The weight of a bag of potatoes is given as 9 kg to the nearest kg. Give the maximum and minimum possible weight of 6 of these bags.

A number is given as 1.26 to 3 significant figures. Give the maximum and minimum possible values for this number and show this on a number line.

A field's dimensions are given as 35m by 47m with each measurement given to the nearest metre. Give the maximum possible area for the field.

If I run 100m in 12.5 seconds find my average speed in m/s. If the distance is correct to the nearest metre and the time to the nearest tenth of a second find my maximum possible speed.

PRIME FACTORISATION

The first seven prime numbers are;

Every number can be written as a **product of its prime factors** ie as a series of prime numbers multiplied together

1. Write 720 as a product of its prime factors

2. Write 405 as a product of its prime factors

LOWEST COMMON MULTIPLE (LCM)

This is the _____ number which is _____ to both times tables.

List the first few multiples of the following numbers and hence find their least common multiple.

1. 3 and 5

2. 4 and 6

3. 10 and 12

4. 8 and 20

5. 15 and 25

6. 4, 6 and 9

7. 15, 20, 30, 45

HIGHEST COMMON FACTOR (HCF)

This is the _____ number which is _____ to both sets of factors.

List the factors of the following numbers and hence find their HCF.

1. 12 and 15

2. 14 and 26

3. 36 and 12

4. 18 and 24

5. 15 and 25

6. 120 and 48

FRACTIONS
These questions will ask you to SHOW. That means, you must treat them as a non-calculator question and show every step of your working.

Adding and Subtracting Fractions

Put over a common denominator

1. $2\frac{1}{3} - 1\frac{3}{5}$

2. $3\frac{1}{2} - 1\frac{5}{6}$

Multiplying and Dividing Fractions

1. $\frac{2}{3} \times \frac{5}{8}$

2. $2\frac{2}{3} \times 1\frac{5}{8}$

3. $\frac{2}{3} \div \frac{5}{9}$

4. $\frac{2}{3} \div 6$

5. $1\frac{1}{2} \div 2\frac{2}{3}$

BODMAS

Work out $10-6\times2$ and check on a calculator

Repeat for:

1. $10+4\times2$

2. $2(4+7)$

3. $\frac{1}{2}+\frac{2}{3}\times\frac{3}{5}$

Big division signs act like a bracket:

4. $\frac{2\times3+5}{2+6}$

5. $\frac{3+2\times9}{4-7}$

6. $\frac{\frac{2}{3}\times\frac{1}{2}}{\frac{3}{4}}$

STANDARD FORM

Write in standard form

1. 246000

2. 0.000023

Write as a normal number

3. 4.1×10^{6}

4. 2.1×10^{-5}

Example GCSE Question; Calculating in Standard Form

1. If a=4×10^{6} and b=6×10^{6}, giving your answers in standard form;

   Find ab

   Find $\frac{a}{b}$

2. If a=$p\times10^{n}$ and b=$q\times10^{n}$

   Find ab given that $pq>10$

   Find $\frac{a}{b}$ given that $\frac{p}{q}<1$

   Find a+b given that $p+q>10$

RATIO

Dividing in a given ratio

Share 15 sweets in the ratio 3:2

Share £200 in the ratio 1:3:4

A sum of money is shared in the ratio 2:3. If the first person gets £50 how much does the second person get?

A recipe requires sugar and flour to be in the ratio 3:10. If I put in 120g of sugar how much flour should I put in?

INDICES

Basic Laws

Negative Powers

$$x^{-a} =$$

Examples

5^{-2}

3^{-3}

2^{-4}

Fractional Powers (numerator = 1)

$$x^{\frac{1}{a}} =$$

Examples

$100^{\frac{1}{2}}$

$27^{\frac{1}{3}}$

$16^{\frac{-1}{4}}$

Fractional Powers (numerator ≠1)

$$x^{\frac{b}{a}} =$$

Examples

$27^{\frac{2}{3}}$

$32^{\frac{3}{5}}$

$25^{\frac{-3}{2}}$

PERCENTAGES QUESTIONS

There are _____ types of percentage question:

Type 1 Percentage of a number

Find 47% of £2.50

Type 2 One number out of another as a percentage.

Alice scores 36 out of 45 in a test. What is this as a percentage?

Type 3 Percentage Increase.

During the FY Alice grows from 1.46 to 1.53 tall. What is the percentage increase in her height?

Type 4 Compound change.

Example 1

I invest £700 at 4% interest per year for 3 years. How much is it worth?

Example 2

My car cost £5000. If it depreciates at 15% per year, how much will it be worth in 3 years time?

Type 5 Reverse percentages

After a 20% reduction in price a pair of shoes costs £45. What was the original cost?

DIRECT & INVERSE PROPORTION

Given that y is directly proportional to the square of x and that $y = 75$ when $x = 5$, find an equation linking x and y.

INVERSE PROPORTION

Given that y is inversely proportional to the square of x and that y is 1 when x is 100, find the equation linking y and x.

CONVERTING RECURRING DECIMALS TO FRACTIONS

Multiply by 10, 100 or 1000 depending upon whether there are

_____ _____ or _____ recurring digits

Example

$0.\dot{7} = 0.777$

$0.\dot{6}\dot{2}$

$0.\dot{7}0\dot{4}$

$0.6\dot{4}$

$0.5\dot{3}$

SURDS

To write something as a 'surd' means to

Simplifying Surds

Look for the biggest _____ number inside the square root

Examples

$\sqrt{72}$

$\sqrt{32}$

$\sqrt{8}$

Multiplying out brackets

Use 'eyebrows, chin and a smile' as you would with algebra.

Examples

$\left(2+\sqrt{2}\right)\left(3+\sqrt{2}\right)$

$\left(1+\sqrt{3}\right)\left(1-\sqrt{3}\right)$

$\left(1+\sqrt{5}\right)^2$

Simplifying Fractions

The examiner will want you to get rid of the square root from the bottom of the fraction. This is known as

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Examples

$$\frac{3}{\sqrt{2}}$$

$$\frac{\sqrt{2}}{\sqrt{3}}$$

$$\frac{\sqrt{8}}{\sqrt{3}}$$

$$\frac{\left(1+\sqrt{2}\right)}{\sqrt{5}}$$

$$\frac{2}{3+\sqrt{5}}$$

$$\frac{4}{5+\sqrt{7}}$$

Common Exam Question

Given that $\left(1+\sqrt{x}\right)\left(3+\sqrt{x}\right)=y+4\sqrt{5}$, find both x and y.