BASIC MATH

GCSE RECAP

**Converting between fractions, decimals & percentages**

Decimals to fractions

0.723

|  |  |  |  |
| --- | --- | --- | --- |
|  | 10th | 100th | 1000th |
| 0. | 7 | 2 | 3 |

As 3dp, this would be 723/1000

0.7 = 7/10

0.72 = 72/100

0.723 = 723/1000

Remember to cancel down afterwards if possible

0.46 = 46/100 = 23/50

Decimal to percent

‘per cent’ means ‘per hundred’ – so multiple decimal by 100 to get percent

0.375 x 100 = 37.5%

Fractions to decimals

Divide the numerator by the denominator

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 0 | . | 3 | 7 | 5 |
| 8 |  |  | 3 | 6 | 4 |
| 3 | . | 0 | 0 | 0 |

1. 3 does not divide in to 8 so move to the next DP and pass the 3
2. 8 divides into 30 3 times, with 6 remaining, so move 6 on to the next DP
3. 8 divides in to 60 7 times, with 4 remaining, so move 4 on to the next DP
4. 8 divides in to 40 5 times

Percent to decimals & fractions

24% would be 0.24 as a decimal (divide by 100), and 24/100 as a fraction (over 100)

**Converting recurring decimals**

e.g. 5/6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 0 | . | 8 | 3 | 3 |
| 6 |  |  | 5 | 2 | 2 |
| 5 | . | 0 | 0 | 0 |

1. 5 does not divide by 6 so move over 1dp
2. 6 divides in to 50 8 times, with 2 left over
3. 6 divides in to 20, 3 times with 2 left over (notice 2 left over again)
4. This is recurring as there will always be 2 remaining from this point

**Standard form**

Standard form is a system of writing numbers which can be particularly useful for working with very large or very small numbers:

Powers of 10:

* 10^0 = 1
* 10^1 = 10
* 10^2 = 100
* 10^3 = 1000
* 10^4 = 10,000
* 10^5 = 100,000
* 10^6 = 1,000,000
* 10^7 = 10,000,000
* 10^8 = 100,000,000

Example: 50,000 in standard form is 5x10^4

This can also be written like 5E+15 // where E is exponent

Example: 800,000 in standard form is 8E+5

Example: 0.000059 in standard form is 5.9E10-5

**Multiply without calculator**

15 \* 12

|  |  |  |
| --- | --- | --- |
|  | 1 | 5 |
|  | 1 | 2 |
|  | 3 | 0 |
| 1 | 5 | 0 |
| 1 | 8 | 0 |

1. Multiply from the right-hand side first, so in this instance we start by multiplying 2 individually, against the numbers above it, whilst moving to the left
2. 2 \* 5 = 10, we write 0 below the line, and pass the 1 over
3. 2 \* 1 = 2, add the 1 that was passed over we get 3, so that goes directly below
4. Now, we start to multiply the 1, but remember, this is a tenth, so we multiply 10 (not 1)
5. 10 \* 5 = 50, write 0 below, and pass the 5 across
6. 10 \* 1 = 1, add the 5 which was passed over, and we get 15
7. We now add these 2 ‘answers’ together, to get the final answer

Example:

16 \* 11

|  |  |  |
| --- | --- | --- |
|  | 1 | 6 |
|  | 1 | 1 |
|  | 1 | 6 |
| 1 | 6 | 0 |
| 1 | 7 | 6 |