PERCENTAGES

**Changing percentages to fractions**: put it over 100 eg. 36% = $\frac{36}{100}=\frac{9}{25}$

**Changing fraction to percentage**: on calculator using a b/c button to change into decimal and then x by 100 eg. $\frac{4}{7}×100=57.1\%$ (57r1r7 appears on calculator. It means $57\frac{1}{7}$. If you press a b/c button again it will change it to a decimal)

or you can go 4÷7 x 100

**Changing fraction to decimal** - just divide on calculator ie. 4÷7

**Changing percentage to decimal** - just ÷ 100

**Changing decimal to fraction** - eg. 0.612 take away decimal point so 0612, put it over 1 and how many decimal places there are so $\frac{612}{1000}$ and simplify $\frac{153}{250}$

**Working out percentages**

Eg. Find 26% of 56

Change to decimal first (0.26) and then multiply so 0.26 x 56 = 14.56

**Finding percentage**

Eg. Find 26 as a percentage of 35

Divide the numbers and then multiply by 100 so 26 ÷ 35 x 100 = 74.3%

**Increasing/Decreasing Percentages**

Add or subtract from 100%.

Eg. Decrease 35 by 15%

Subtract 15 from 100 = 85% and then change to decimal = 0.85 and multiply

so 0.85 x 35 = 29.75

**GST**

Add 15% to 100% = 115% = 1.15 (by dividing by 100 ie. Making a decimal)

**Finding original price**

Take away from 100% if discount, sale, loss eg. 18% discount = 100 – 18 = 82% = 0.82

Add onto 100% if GST, profit, markup eg. GST is 100 + 15 = 115% = 1.15

Eg. Find the price before GST (or GST exclusive) if the product is on the shelf at $22.

 Old price x % = New Price

 ? x 1.15 = 22

 So ? = 22 ÷ 1.15 = $19.13 is the price before GST

Eg 2. Find the price before discount of 60% a pair of jeans that have a price tag of $50

 Old price x % = New price (100% - 60% = 40% = 0.4)

 ? x 0.4 = $50

 ? = 50 ÷ 0.4 = $125

**Percentage Increase/Decrease**

Eg. If the school roll increased from 250 to 280 find the percentage increase:

 Work out actual increase (280 – 250 = 30) and divide by what happened first (ie. the

 original roll of 250

 so 30 ÷ 250 = 0.12 = 12%

FRACTIONS

**Finding fractions of a number**

* Just multiply ie $\frac{3}{5}×45=3÷5×45=27$

**Multiplying fractions**

* Top times top and bottom times bottom

$\frac{2}{3} × \frac{5}{7} = \frac{10}{21}$

**Dividing fractions**

* Easy as pie – flip the second and multiply

$\frac{3}{4}÷2 = \frac{3}{4} ÷ \frac{2}{1} = \frac{3}{4} × \frac{1}{2} = \frac{3}{8} $

**Adding and subtracting fractions**

* Add the numerators only and there must be a common denominator

Eg. $\frac{3}{5}+\frac{1}{5}=\frac{4}{5}$

* When the denominator is not the same then find the smallest number that both denominators will go into and multiply then add

 Eg. $\frac{5}{8}+\frac{2}{3}$

 Smallest number that 8 and 3 goes into is 24 so multiply the first fraction by 3 and

 second by 8

 $\frac{3}{3} × \frac{5}{8}+ \frac{2}{3} × \frac{8}{8} = \frac{15}{24}+ \frac{16}{24} = \frac{31}{24}$

**Changing decimals to fractions**

* Can’t combine decimal into fractions eg. $\frac{3.6}{14.38}$
* To get off just multiply by the highest number of decimal places eg. 2 dps then 100, 3 then 1000 etc
* $\frac{3.6}{14.38}×\frac{100}{100}=\frac{360}{1438}=\frac{180}{719}$ by simplifying on calculator

RATIOS

**Simplifying ratios**

* treat like simplifying fractions – find the biggest number that goes into both

eg. 8 : 12 divide both by 4 = 2 : 3

* make sure there are common units

eg. 100mL : 3L - multiply 3L by 1000 to change into mL = 100mL : 3000mL

 = 1 : 30 by dividing both by 100

**Dividing in given ratios**

* eg. If Jane and Steve bought a Lotto ticket and Jane put in $7 and Steve $8, divide the winnings if they won $675

|  |  |
| --- | --- |
| Jane | Steve |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Divide the $675 into 15

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |

So Jane won 7 x 45 = $315 and Steve won 8 x 45 = $360

* Eg. A mine produces 300 tonnes of **copper** each week. The ratio of copper to zinc in the ore is 3 : 2. What is the total amount of ore is produced?

|  |  |
| --- | --- |
| Copper | Zinc |
|  |  |  |  |  |
| = 300 tonnesSo each square is 100 tonnes |  |  |
| 100 | 100 | 100 | 100 | 100 |

so total production is 5 x 100 = 500 tonnes

INTEGERS

**Adding and Subtracting**

If adding a positive number move to the right on the number line

If adding a negative number move to the left

If subtracting a positive number move to the left

If subtracting a negative number move to the right

The first number just tells you where to start

**Multiplying and Dividing**

|  |  |  |
| --- | --- | --- |
| X | Positive | Negative |
| Positive | Positive | Negative |
| Negative | Negative | Positive |