Year 9 Rational Numbers

Rational Number: A rational number is any number that can be written in the form $\frac{a}{b}, where\ b \neq 0$.

Rational Numbers

- Whole Numbers (1)
- Zero (0)
- Whole Negative Numbers (-3)
- Fractions
- Proper $(\frac{2}{3})$

- Improper $(\frac{16}{3})$
- Mixed $(5\frac{1}{3})$
- Decimals $(0.\dot{6})$
- Percentages $(37.\dot{3}\%)$
- Ratios $(2:3)$

Fractions, Decimals and Percentages

IMPROPER → MIXED

$-\frac{16}{3} = 5\frac{1}{3}$

PERCENTAGE → DECIMAL

$12.5\% = 0.125$

DECIMAL → FRACTION

$0.12 = \frac{12}{100} = \frac{3}{25}$

PERCENTAGE → FRACTION

$12\% = \frac{12}{100} = \frac{3}{25}$

RECURRING DECIMAL → FRACTION

$0.2\overline{53}$

$Let\ x\ be\ 0.2\overline{53}$

$x = 0.2\overline{53}$

$10x = 2.\overline{53}$ – Cannot remove ending from x.

$100x = 25.\overline{35}$ – Still can't as the recurring is not the same.

$1000x = 253.\overline{53}$ - Same ending as 10x, so take away.

$1000x - 10x = 253.\overline{53} - 2.\overline{53}$

$990x = 251$

$x = \frac{251}{990}$

Percentages

INCREASING

Increase 26 *by* 8%

$100\% + 8\% = 108\%$

$= 26 \times 108\%$

$= 26 \times \frac{108}{100}$

$= \frac{2808}{100}$

$= \$28.08$

DECREASING

Decrease $26kg$ *by* 8%

$100\% - 8\% = 92\%$

$= 26 \times 92\%$

$= 26 \times \frac{92}{100}$

$= \frac{2392}{100}$

$= 23.92$ kg

ROUNDING USING DECIMAL PLACES
Round 53.4358745 to 4 dp.
53.4358|745 − Round up.
53.4359 (to 4 dp.)

ROUNDING USING SIGNIFICANT FIGURES − WHOLE NUMBERS
Round 3187586 to 3 sig. fig.
318|7586 − Round up
3190000 (to 3 sig. fig.)

ROUNDING USING SIGNIFICANT FIGURES − DECIMALS
Round 5.34567234 to 5 sig. fig.
5.3456|7234 − Round up
5.3457 (to 5 sig. fig.)

ZEROS IN POSITIVE NUMBERS
3450000000 has 3 sig. fig.

ZEROS IN NEGATIVE NUMBERS
0.2000352 has 7 sig. fig., but
0.0000352 has 3 sig. fig.

POSITIVE NUMBERS
Move the decimal place until it is on the right of the last number you meet. Count how many digits you moved when moving the decimal place.

$6000000000000 = 6 \times 10^{12}$

$7450000000000 = 7.45 \times 10^{12}$

NEGATIVE NUMBERS
Move the decimal place until it is on the right of the first number you meet. Count how many digits you moved when moving the decimal place.

$0.000003 = 3 \times 10^{-6}$

$0.0000000234735 = 2.34735 \times 10^{-8}$