2 - Fractions, Ratio and Proportion

Fractions

- ***Recurring Decimal to fraction*** ⟶

① multiply decimal so that no recurred value is below 0

e.g. $x = 0.32$ ⟶ 32.32 (×100) = $100x$

This may be, ×10, ×100 or more depending the size of the recurring pattern.
Make sure the decimal point is followed by the recurring numbers in order to eliminate them when choosing 1x/10x/100x

② minus $1x$ from this new value (eg. $100x$) to get a non recurring value ($100x$ - x)

$0.32 = 1x$ | $100x - x = 99x$

$32.32 = 100x$ | $32.32 - 0.32 = 32 = x99$

③ ÷ value by 9/99/999 to get x

$32/99 = x = 0.32$

0.2 ↠ 2/9
0.54 ↠ 54/99

0.376 ↠ 376/999
0.6298 ↠ 6298/9999

- ***Dividing by decimals*** ⟶

Change the value of the decimal to a value above 1.
What you do to the decimal must be done to the numerator.
45 ÷ 0.4 (45/0.4)→ ×10 → 450/4 = 112.5
46 ÷ 0.02 (46/0.2)→ ×100 → 4600/2 = 2300

Percentage

- ***Fraction to percentage*** ⟶

① (x / total) × 100 → e.g. (3/25) × 100 = 12%
or ② make denominator 100 e.g. 3/25 → ×4 = 12/100 = 12%

- ***The Multiplier*** ⟶

Value × $(1 \pm x)^n$

- 100% = 1
- 10% = 0.1
- 1% = 0.01
- 0.1% = 0.001

In formula →
Increase = +
Decrease = -
n = compound years

- so, a table decreases by 10% in a sale

table price = value
value × (100% - 10%) = value × (1-0.1)

- ***% Change (Increase/Loss)*** ⟶

① Difference in quantity = new - original
② **(Difference in quantity / original) × 100** = %difference/change

Or

① (New / Original) × 100
② minus 100% (1)

negative result = %loss
positive result = %increase

- ***Reverse Percentage*** ⟶

Trying to find the original amount — 1% = 8.696
Find 1%, × 100 to get 100% — ×100
e.g. 2.3% = £20 — 100% = £869.60
÷2.3

or

To find the original, we can ÷ by the decimal multiplier
e.g.
20% increase = £240 = 120% of original (1.2)
240 ÷ 1.2 = £200 = 100%

28890 = 107%
28890 ÷ 1.07 = 2700 = 100%

- ***Simple interest*** ⟶

£1000 at 10% interest for 3 years
10% = £100 — £100 × 3 = £300
£1000 + £300 = £1300 after 3 years
The interest rate and value stays the same

- ***Compound interest*** ⟶ Repetitive cycle that uses each new amount

£1000 at 10% interest per year/every year for 3 years

1st year = £1000 + 10%(£100) = £1100
2nd year = £1100 + 10%(£110) = £1210
3rd year = £1000 + 10%(121) = £1331

To use the multiplier, we put the time regarding the rate into ^{n}
→ $1000 \times (1.1)^3 = £1331$
the value of n may change depending on month/year/hour so we must use multiplication/division to work out the indie value. e.g. 10% per month for 3 years = $1000 \times (1.1)^3$