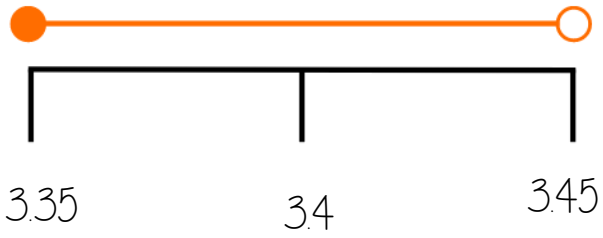
Error Intervals

Example

The length of a table is 3.4m rounded to 1dp. Write down the error interval for the length l.



$$3.35 \leq l < 3.45$$

Bounds Calculations

When calculating with bounds, first find the upper and lower bounds of each number, before using the following rules to calculate

Operation	Rule
Adding	Upper bound + upper bound = upper bound Lower bound + lower bound = lower bound
Subtracting	Upper bound − lower bound = upper bound Lower bound − upper bound = lower bound
Multiplying	Upper bound × upper bound = upper bound Lower bound × lower bound = lower bound
Dividing	Upper bound ÷ lower bound = upper bound Lower bound ÷ upper bound = lower bound

Recurring Decimals to Fractions

Example: Convert $0.\dot{7}$ to a fraction

Remember, $0.\dot{7} = 0.777\ldots\ldots$

Our first step is to form a simple equation where $x = 0.77\ldots$ By multiplying both sides by 10 we can obtain another equation with $10x = 7.77\ldots$ Now we eliminate the recurring part of the decimal by subtracting x from $10x$.

$$x = 0.77\ldots$$
$$10x = 7.77\ldots$$
$$9x = 7$$
$$x = \frac{7}{9}$$

So we have our answer $0.77\ldots = \frac{7}{9}$.

The important part to remember is to get two equations in x where the recurring part after the decimal point is exactly the same.

Repeated percentage change

Compound Interest

Tess invests £100 at 10% compound interest for 3 years

£100 × 1.10 × 1.10 × 1.10

£100 × 1.10 (3)

Original amount; Repeated multiplier; Number of occurrences

Depreciation

Depreciation calculations use multipliers **less than** 1

Multipliers are commutative – an overall multiplier effect can be calculated by combining the multipliers separately

e.g. Increase of 10% then a reduction of 10%

× 1.10 × 0.9 = × 0.99 The multiplier

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