

# N1 Calculations and Accuracy – Y10 Heptagon

## Knowledge Organiser

### Keywords

**Estimate** - to find a value close enough to the correct value using rounding in the calculation

**Rounding** - make a number simpler but keep it close to its actual value

eg 74 rounded to the nearest 10 is 70

**Significant figures (SF)** - these are the digits within a number that we round to, we count significant figures from the left of a number. We use zeros to show the size of the number.

### Rounding to SF Examples

Round **1346** to 2 sf, counting from the left the 2<sup>nd</sup> SF is the 3  
So it rounds to either 1300 or 1400  
1346 is closer to 1300 so = 1300

Round **4.67** to 1 sf, counting from the left the 1<sup>st</sup> SF is the 4  
So it rounds to either 4 or 5  
4.67 is closer to 5 so = 5

### Bounds Examples

**Lower bound** - the smallest value that a given measurement could be given the accuracy it has been rounded to

**Upper bound** - the value at which a rounded number would round up, given the accuracy it has been rounded to

**Error interval** - an inequality showing the lower and upper bounds of a rounded measurement

To find lower and upper bounds

- Identify the level of accuracy it has been rounded to
- Find half that value
- Add it on to find the upper bound
- Subtract to find the lower bound

### EXAMPLES:

#### Error Intervals

A number,  $n$ , is rounded to 1 decimal place.

The result is 6.7

Write the error interval for  $n$ .

$$0.1 \div 2 = 0.05 \text{ so UB} = 6.7 + 0.05 = 6.75, \text{ LB} = 6.7 - 0.05 = 6.65$$



A number,  $d$ , is rounded to the nearest 50.

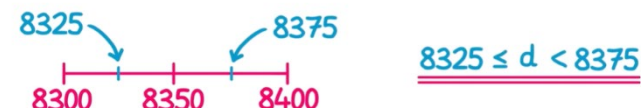
The result is 8350

Write the error interval for  $d$ .

$$50 \div 2 = 25 \text{ so}$$

$$\text{UB} = 8350 + 25 = 8375$$

$$\text{LB} = 8350 - 25 = 8325$$



### Estimation Examples

To ESTIMATE you round each number off to 1 significant figure and then work out the calculation with the rounded values.

EG

Work out an estimate for

$$\frac{203 \times 9.93}{0.511}$$

$$\approx \frac{200 \times 10}{0.5}$$

$$= \frac{2000}{0.5}$$

$$= 4000$$

EG

Use approximations to estimate the value of

$$\frac{4.02^2 + \sqrt{102}}{0.51}$$

$$\approx \frac{4^2 + \sqrt{100}}{0.5}$$

$$= \frac{16 + 10}{0.5}$$

$$= \frac{26}{0.5}$$

$$= 52$$

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