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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Accuracy**  |
| 1. Place Value | The **value** of where a **digit** is within a number. | In 726, the value of the 2 is 20, as it is in the ‘tens’ column. |
| 2. Place Value Columns | The names of the columns that **determine the value of each digit**.The ‘ones’ column is also known as the ‘units’ column. | Image result for place value columns |
| 3. Rounding | To make a number simpler but keep its value close to what it was.If the **digit to the right** of the rounding digit is **less than 5, round down**. If the **digit to the right** of the rounding digit is **5 or more, round up**. | 74 rounded to the nearest ten is 70, because 74 is closer to 70 than 80.152,879 rounded to the nearest thousand is 153,000.  |
| 4. Decimal Place | The **position** of a digit to the **right of a decimal point**. | In the number 0.372, the 7 is in the second decimal place.0.372 rounded to two decimal places is 0.37, because the 2 tells us to round down.Careful with money - don’t write £27.4, instead write £27.40 |
| 5. Significant Figure | The significant figures of a number are the digits which **carry meaning** (ie. are significant) to the size of the number.The **first significant figure** of a number **cannot be zero**.In a number with a decimal, trailing zeros are not significant. | In the number 0.00821, the first significant figure is the 8.In the number 2.740, the 0 is not a significant figure.0.00821 rounded to 2 significant figures is 0.0082.19357 rounded to 3 significant figures is 19400. We need to include the two zeros at the end to keep the digits in the same place value columns. |
| 6. Truncation | A method of approximating a decimal number by **dropping all decimal places** past a certain point **without rounding**. | 3.14159265… can be truncated to 3.1415 (note that if it had been rounded, it would become 3.1416) |
| 7. Error Interval | A **range of values** that a number could have taken before being rounded or truncated.An error interval is written using inequalities, with a **lower bound** and an **upper bound**.Note that the lower bound inequality can be ‘equal to’, but the upper bound cannot be ‘equal to’. | 0.6 has been rounded to 1 decimal place. The error interval is:$$0.55\leq x<0.65$$The lower bound is 0.55The upper bound is 0.65 |
| 8. Estimate | To find something **close to the correct answer**. | An estimate for the height of a man is 1.8 metres. |
| 9. Approximation | When using approximations to estimate the solution to a calculation, **round each number in the calculation to 1 significant figure**.$≈ $means ‘approximately equal to’ | $$\frac{348+692}{0.526}≈\frac{300+700}{0.5}=2000$$‘Note that dividing by 0.5 is the same as multiplying by 2’ |
| 10. Rational Number | A number of the form $\frac{p}{q}$**,** where $p$ **and** $q$ **are integers** and $q\ne 0.$A number that cannot be written in this form is called an ‘irrational’ number | $\frac{4}{9}, 6, -\frac{1}{3}, \sqrt{25}$ are examples of rational numbers.$π, \sqrt{2}$ are examples of an irrational numbers. |
| 11. Surd | The **irrational number** that is a **root of a positive integer,** whose value cannot be determined exactly.Surds have **infinite non-recurring decimals**. | $\sqrt{2}$ is a surd because it is a root which cannot be determined exactly.$\sqrt{2}=1.41421356…$ which never repeats. |
| 12. Rules of Surds | $$\sqrt{ab}=\sqrt{a}×\sqrt{b}$$$$\sqrt{\frac{a}{b}}=\frac{\sqrt{a}}{\sqrt{b}}$$$$a\sqrt{c}\pm b\sqrt{c}=\left(a\pm b\right)\sqrt{c}$$$$\sqrt{a}×\sqrt{a}=a$$ | $$\sqrt{48}=\sqrt{16}×\sqrt{3}=4\sqrt{3}$$$$\sqrt{\frac{25}{36}}=\frac{\sqrt{25}}{\sqrt{36}}=\frac{5}{6}$$$$2\sqrt{5}+7\sqrt{5}=9\sqrt{5}$$$$\sqrt{7}×\sqrt{7}=7$$ |
| 13. Rationalise a Denominator | The process of rewriting a fraction so that the **denominator contains only rational numbers**. | $$\frac{\sqrt{3}}{\sqrt{2}}=\frac{\sqrt{3}×\sqrt{2}}{\sqrt{2}×\sqrt{2}}=\frac{\sqrt{6}}{2}$$$$\frac{6}{3+\sqrt{7}}=\frac{6\left(3-\sqrt{7}\right)}{\left(3+\sqrt{7}\right)\left(3-\sqrt{7}\right)}=\frac{18-6\sqrt{7}}{9-7}=\frac{18-6\sqrt{7}}{2}=9-3\sqrt{7}$$ |

**Knowledge Organiser**