£2000 is invested. It earns simple interest of 3% each year. How much will there be after 7 years?

\[
\begin{align*}
\text{Principal} & = £2000 \\
\text{Rate} & = 3\% \\
\text{Time} & = 7 \text{ years}
\end{align*}
\]

\[
\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time} = £2000 \times 0.03 \times 7 = £420
\]

\[
\text{Total Amount} = \text{Principal} + \text{Interest} = £2000 + £420 = £2420
\]

**Decimal → Percentage**

\[0.43 \times 100 = 43 \rightarrow 43\%
\]

\[79\% \text{ means } 79 \div 100 = 0.79 \]

**Negative Number Rules – Add & Subtract**

+ becomes a subtraction \( \rightarrow 13 - 7 = 13 - 7 = 6 \)

the answer is lower

- becomes an addition \( \rightarrow 12 + 8 = 12 + 8 = 20 \)

the answer is higher

**Fraction Rules – Multiply and Divide**

Multiplication – multiply top by top and bottom by bottom

\[\frac{1}{2} \times \frac{3}{4} = \frac{1 \times 3}{2 \times 4} = \frac{3}{8}\]

Division – flip second fraction and multiply

\[\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} = \frac{4}{6} = \frac{2}{3}\]

Simpler rule for subtraction, just take away the numerators at the end!

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>0.5</td>
<td>50%</td>
</tr>
<tr>
<td>1/4</td>
<td>0.25</td>
<td>25%</td>
</tr>
<tr>
<td>3/4</td>
<td>0.75</td>
<td>75%</td>
</tr>
<tr>
<td>1/3</td>
<td>0.3333</td>
<td>33 1/3%</td>
</tr>
<tr>
<td>2/3</td>
<td>0.6667</td>
<td>66 2/3%</td>
</tr>
<tr>
<td>1/10</td>
<td>0.1</td>
<td>10%</td>
</tr>
<tr>
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<td>0.2</td>
<td>20%</td>
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<tr>
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<td>0.4</td>
<td>40%</td>
</tr>
<tr>
<td>4/5</td>
<td>0.8</td>
<td>80%</td>
</tr>
</tbody>
</table>

**Changing between Units of Measure**

- **10mm = 1cm**
- **100cm = 1m**
- **1000m = 1km**
- **1000ml = 1 litre**
- **5 miles = 8 kilometres**

**Estimating the Mean from a Grouped Frequency Table**

<table>
<thead>
<tr>
<th>Weight, (w), Kg</th>
<th>Frequency</th>
<th>Total Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>(40 \leq w &lt; 50)</td>
<td>55</td>
<td>2650</td>
</tr>
<tr>
<td>(50 \leq w &lt; 60)</td>
<td>35</td>
<td>1525</td>
</tr>
<tr>
<td>(60 \leq w &lt; 70)</td>
<td>25</td>
<td>1175</td>
</tr>
<tr>
<td>(70 \leq w &lt; 80)</td>
<td>15</td>
<td>825</td>
</tr>
<tr>
<td>(80 \leq w \leq 90)</td>
<td>10</td>
<td>900</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>3005</td>
</tr>
</tbody>
</table>

**Sample Space Diagram**

shows all outcomes

---

**Tree Diagrams**

---

**Square, Cube & Prime Numbers**

<table>
<thead>
<tr>
<th>Square numbers</th>
<th>Cube numbers</th>
<th>Prime numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1^2 = 1)</td>
<td>(8^3 = 512)</td>
<td>2</td>
</tr>
<tr>
<td>(2^2 = 4)</td>
<td>(9^3 = 729)</td>
<td>3</td>
</tr>
<tr>
<td>(3^2 = 9)</td>
<td>(10^3 = 1000)</td>
<td>5</td>
</tr>
<tr>
<td>(4^2 = 16)</td>
<td>(11^3 = 1331)</td>
<td>7</td>
</tr>
<tr>
<td>(5^2 = 25)</td>
<td>(12^3 = 1728)</td>
<td>11</td>
</tr>
<tr>
<td>(6^2 = 36)</td>
<td>(13^3 = 2197)</td>
<td>13</td>
</tr>
<tr>
<td>(7^2 = 49)</td>
<td>(14^3 = 2744)</td>
<td>17</td>
</tr>
<tr>
<td>(8^2 = 64)</td>
<td>(15^3 = 3375)</td>
<td>19</td>
</tr>
<tr>
<td>(9^2 = 81)</td>
<td>(16^3 = 4096)</td>
<td>23</td>
</tr>
<tr>
<td>(10^2 = 100)</td>
<td>(17^3 = 4913)</td>
<td>29</td>
</tr>
</tbody>
</table>

**Common Fraction, Decimal, Percentage**

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</tr>
</tbody>
</table>

**BIDMAS – Order of Operations**

- **B – Brackets**
  - \((7 + 5)^3 + 6 \times 3\)
- **I – Indices**
  - \(12^2 + 6 \times 3\)
- **D – Division**
  - \(144 + 6 \times 3\)
- **M – Multiply**
  - \(144 + 18\)
- **A – Addition**
  - \(162\)

**Sharing in a Given Ratio**

Share £60 in the ratio 7 : 5.

- Add the parts \( \rightarrow 7 + 5 = 12 \)
- Divide total by parts \( \rightarrow £60 \div 12 = £5 \)
  
(value of one part)
- Multiply to find how much each person gets \(- £5 \times 7 = £35 \)
\(- £5 \times 5 = £25 \)

**Estimating**

Remember to round every number to 1 significant figure

\[
\begin{align*}
589 \times 202 & \rightarrow 600 \times 200 = 12,000 \\
68 \times 5.3 & \rightarrow 70 \times 5 = 350 \\
8.71 \times 0.49 & \rightarrow 9 \times 0.5 = 4.5
\end{align*}
\]

**Simple Interest**

£2000 is invested. It earns simple interest of 3% each year. How much will there be after 7 years?

- Find 3% of £2000 \( \rightarrow 2000 \times 0.03 = £60 \) (the interest)
- Multiply the interest by the years \( \rightarrow £60 \times 7 \text{ years} = £420 \) (total interest).
- Add this to the starting amount \( £2000 + £420 = £2420 \).

**The Three Averages**

- **Mean** \( \rightarrow \) add all the numbers together and divide by how many numbers there are.
- **Median** \( \rightarrow \) put the numbers in order, then find the middle number
- **Mode** \( \rightarrow \) the most common value

---

**Negatives Number Rules – Multiply & Divide**

If the signs are the same, the answer will be positive!
Types of Data
- Discrete data → takes certain values e.g. number of people
- Continuous data → can take any value e.g. weight, time (can be a decimal)
- Qualitative data → worded data e.g. type of pet
- Quantitative data → numerical data e.g. height
- Primary data → collected yourself
- Secondary data → collected from internet or books

Area of a square or rectangle = length x width

Area of a triangle = \frac{1}{2} \times \text{base} \times \text{height}

Volume of Prism = \text{Area of cross section} \times \text{depth}

Surface Area
\text{Total the area of every face!}

Algebra Key Words
- Term → a
- Expression → 2a
- Equation → 2a + 10 = 20
- Formula → a = 2b + 10

Algebraic Manipulation
- a + a = 2a
- a + b = a + b (cannot simplify)
- a \times b = ab\quad \frac{a}{b} = a \div b
- a \times a = a^2

Inequalities
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
<th>Graph</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;</td>
<td>Is greater than</td>
<td>○</td>
</tr>
<tr>
<td>&lt;</td>
<td>Is less than</td>
<td>○</td>
</tr>
<tr>
<td>≥</td>
<td>Is greater than or equal to</td>
<td>● ●</td>
</tr>
<tr>
<td>≤</td>
<td>Is less than or equal to</td>
<td>● ●</td>
</tr>
</tbody>
</table>

Equation of a Straight Line
\text{y = mx + c}
 \text{m} – gradient of the line \text{c} – y intercept

How to find the gradient of a straight line

Expand and Factorise

\text{Expanding}
\begin{align*}
2(g + 4) &= 2g + 8 \\
5(e + 3) &= 5e + 15
\end{align*}

\text{Factorising}
\text{Multiply in} \quad \text{Divide out}

Rotational Symmetry
How many times a shape overlaps in a full 360° turn

Line Symmetry
How many mirror lines there are

The triangle has order of rotation 1

Angles in parallel lines
- Alternate angles are equal
- Co-interior angles add to 180°
- Vertically opposite angles are equal
- Corresponding angles are equal