Student Learning Advisory Service

Contact us

Please come and see us if you need any academic advice or guidance.

Canterbury

Our offices are next to Santander Bank

Open
Monday to Friday, 09.00 – 17.00
E: learning@kent.ac.uk
T: 01227 824016

Medway

We are based in room G0-09, in the Gillingham Building and in room DB034, in the Drill Hall Library.

Open
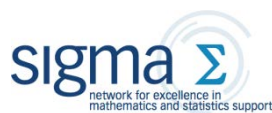Monday to Friday, 09.00 – 17.00
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The Student Learning Advisory Service (SLAS) is part of the Unit for the Enhancement of Learning and Teaching (UELT)

Acknowledgments

sigma Σ
network for excellence in mathematics and statistics support

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AT A GLANCE/ PHARMACY CALCULATIONS $C_1V_1 = C_2V_2$

Using proportional sets to calculate equivalent amounts, strengths and substitutes.
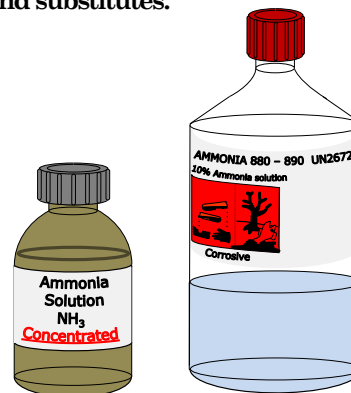
Proportional sets

$C_1V_1 = C_2V_2$ is used to calculate an unknown quantity where two solutions/mixtures are proportional …

C_1V_1 = Concentration/amount (start) and Volume (start)

C_2V_2 = Concentration/amount (final) and Volume (final)

1. Amounts

Calculating how much ingredient is contained in a different volume of the same concentration.

Example 1

If a 300mL bottle of a product contains 15g of ingredient A, how much will contained in a 5mL spoonful?

Method

Step 1: Use $c_1/v_1 = c_2/v_2$

$$\frac{15}{300} = \frac{x(g)}{5}$$

Step 2: Transpose for x and solve

$$x = \frac{15 \times 5}{300} = \mathbf{0.25g} \ \textcolor{red}{\checkmark}$$

Example 2

If a 15mL dose of a product contains 300mg of ingredient B, how much will be contained in 500mL ?

Method

Step 1: Use $c_1/v_1 = c_2/v_2$

$$\frac{300}{15} = \frac{x \ (mg)}{500}$$

Step 2: Transpose for x and solve

$$x = \frac{300 \times 500}{15} = 10{,}000 mg = \mathbf{10g} \ \textcolor{red}{\checkmark}$$

2. Equivalent Strengths

Converting from one measure of strength to another.

Example 1

What is 1 part in 20 expressed as a percentage?

Method

Step 1: Use $c_1/v_1 = c_2/v_2$

$$\frac{1}{20} = \frac{x}{100}$$

Step 2: Transpose for x and solve

$$x = \frac{100}{20} = \mathbf{5\%} \ \textcolor{red}{\checkmark}$$

Example 2

What is 0.25% expressed as a ratio strength?

Method

Step 1: Use $c_1/v_1 = c_2/v_2$

$$\frac{0.25}{100} = \frac{1}{x}$$

Step 2: Transpose for x and solve

$$x = \frac{100}{0.25} = 400 = 1 \text{ part in } 400 \ \textcolor{red}{\checkmark}$$

3. Substitute Quantities

Calculate the quantity of a concentration needed to produce a different final desired concentration and volume (a serial dilution).

Example 1

How much 10% solution is needed to make up 500mL of a 2% solution?

Method

NB: In this case we use $C_1 \times V_1 = C_2 \times V_2$

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$

$$2 \times 500 = 10 \times x \ (\text{mL})$$

Step 2: Transpose for x and solve

$$x = \frac{2 \times 500}{10} = \mathbf{100mL} \ \textcolor{red}{\checkmark}$$

Example 2

How much 5% solution is needed to make up 80ml of a 0.4% solution?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$

$$0.4 \times 80 = 5 \times x \ (\text{mL})$$

Step 2: Transpose for x and solve

$$x = \frac{0.4 \times 80}{5} = \mathbf{6.4mL} \ \textcolor{red}{\checkmark}$$