Goldfish bowl: rearrange formulae – Teacher notes

Activity description

Students practise rearranging formulae. There is a worksheet for individual work, or a set of cards for group work to develop this skill.

Suitability

Level 2 (Intermediate/Higher)

Time

1–2 hours

Resources and equipment

Student worksheet, card sets, slideshow.
The cards can be printed, laminated and cut out for student use

Key mathematical language

Formulae, variable, subject

Notes on the activity

The slideshow and information sheet give examples which can be used to introduce this work, and to demonstrate how to rearrange a variety of formulae.

Ideally you should include formulae which are relevant and useful to your students. If you use the Word versions of these files, you can select the formulae most relevant to your students, delete the rest or add others if you wish.

During the activity

The worksheet includes a wide range of formulae from different contexts that students can use for practice.

Each solution is given on the set of cards. These can be laminated and cut out for use by students who find rearranging formulae difficult. Ask the students to put the cards in the right order, then write out the solution.

Points for discussion

When demonstrating examples, ask students to suggest what to do at each stage. Emphasise that there is sometimes more than one correct answer.

At the end of the activity help students to reflect on the main points.

Extension

More able students could be asked to come up with their own set of guidelines on how to rearrange formulae.

Answers In many cases alternative answers are possible.

1a $u = v - at$ **b** $t = \dfrac{v - u}{a}$

2a $R = \dfrac{P}{I^2}$ **b** $I = \sqrt{\dfrac{P}{R}}$

3 $v = \sqrt{2gh}$

4 $F = \dfrac{9}{5}C + 32$

5a $t = \dfrac{2s}{u + v}$ **b** $v = \dfrac{2s}{t} - u$

6 $r = \sqrt[3]{\dfrac{3V}{4\pi}}$

7a $s = \dfrac{v^2 - u^2}{2a}$ **b** $u = \sqrt{v^2 - 2as}$

8a $a = \dfrac{2(s - ut)}{t^2}$ **b** $u = \dfrac{s}{t} - \tfrac{1}{2}at$

9 $l = \left(\dfrac{T}{2\pi}\right)^2 g$

10a $r = \sqrt{\dfrac{V}{\pi h}}$ **b** $h = \dfrac{S}{2\pi r} - r$

11 $r = \sqrt{R^2 - \dfrac{A}{\pi}}$

12a $r = \sqrt{\dfrac{3V}{\pi h}}$ **b** $h = \sqrt{\left(\dfrac{S}{\pi r}\right)^2 - r^2}$

13a $v = \sqrt{\dfrac{2(E - mgh)}{m}}$ **b** $m = \dfrac{2E}{v^2 + 2gh}$

14 $P = \dfrac{100A}{100 + RT}$

15 $r = 100\left(\sqrt[n]{\dfrac{A}{P}} - 1\right)$

16 $m = 100\left(\sqrt[12]{\dfrac{R}{100} + 1} - 1\right)$