

2.2.1 Formula Rearrangement

Name: _____ Class: _____ Date: _____

KEY WORDS subject

<!-- Session 2 native-skill companion -->

Objective

Practise formula rearrangement within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Rearranging formulae and checking the subject · Foundation

Undo operations on both sides in reverse order. In $A = bh/2$, multiply both sides by 2 then divide by nonzero h to obtain $b = 2A/h$. When the desired variable occurs twice, collect it before dividing. State restrictions introduced by division.

$$A = \frac{bh}{2} \iff b = \frac{2A}{h} \quad (h \neq 0)$$

For $A=24, h=6$ in $A = bh/2$, $b = 2 \times 24/6 = 8$. From $v = u + at$, $a = (v - u)/t$; $v = 19, u = 4, t = 5$ gives $a = 3$. From $y = 3x + 2$, $x = (y - 2)/3$. From $p = qx + r$, $x = (p - r)/q$ for $q \neq 0$. Substitute the result into the original equation to check it.

Doing an operation to only one side breaks the equality. The subject is a variable, not a numerical answer. Check the rearranged result by putting the found value into the original formula.

AQA A5 includes standard and given formulae from other subjects, in words and symbols. Choose a valid unit conversion before substituting; a rearrangement does not itself change units.

■ Rearranging formulae and checking the subject · Higher

Undo operations on both sides in reverse order. In $A=bh/2$, multiply both sides by 2 then divide by nonzero h to obtain $b=2A/h$. When the desired variable occurs twice, collect it before dividing. State restrictions introduced by division.

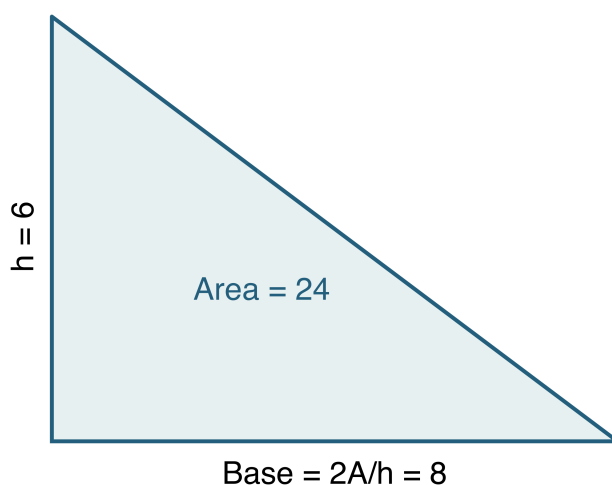
$$A = \frac{bh}{2} \iff b = \frac{2A}{h} \quad (h \neq 0)$$

For $A=24, h=6$, $b=2 \times 24/6=8$. From $v=u+at$, $a=(v-u)/t$; for $v=19, u=4, t=5$ this gives $a=3$. From $y=3x+2$, $x=(y-2)/3$. From $p=qx+r$, $x=(p-r)/q$ for $q \neq 0$. Higher may factor repeated subjects: $y=3x+px$ gives $x=y/(3+p)$ when $p \neq -3$.

Doing an operation to only one side breaks the equality. The subject is a variable, not a numerical answer. Check the rearranged result by putting the found value into the original formula.

AQA A5 includes standard and given formulae from other subjects, in words and symbols. Choose a valid unit conversion before substituting; a rearrangement does not itself change units.

Undo the area formula to find the base



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find b when $A=24, h=6$ in $A=bh/2$.

2.2 (Foundation) Find a for $v=19, u=4, t=5$ in $v=u+at$.

2.3 (Foundation) Find x for $y=17$ in $y=3x+2$.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: To rearrange a formula, an operation may be applied to one side only.

Solutions

2.1 $b=2A/h=48/6$.

2.2 $a=(19-4)/5=3$.

2.3 $x=(17-2)/3=5$.

3.1 False. From $x+3=7$, subtracting 3 on both sides gives $x=4$. Subtracting it only on the left would give $x=7$, which fails the original equation.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.