

Rearranging formulae (powers and more fractions)

Starter

Inequalities example

1. **(Review of previous material)** Rearrange the formulae to make x the subject:

(a) $\frac{a-x}{f} = 2f$

(b) $\frac{M(x+B)}{B} = T$

2. Rearrange $\frac{2a}{x} + 3c = 5d$ to make x the subject.

Notes

Dealing with powers (or **Indices**) is the “**I**” part of **SADMIB** so is one of the last operations to be dealt with.

N.B. The opposite operation of square rooting is squaring etc.
The opposite operation of cubing is cube rooting etc.

E.g. 1 Make w the subject: (a) $x = 1 + \sqrt{w}$ (b) $y = \frac{\sqrt{w-4}}{3}$

Working: (a)

Subtract 1 from both sides:
Square both sides:
New subject on the LHS:

$$\begin{aligned} x &= 1 + \sqrt{w} \\ x - 1 &= \sqrt{w} \\ (x - 1)^2 &= w \\ w &= (x - 1)^2 \end{aligned}$$

E.g. 2 Make w the subject: (a) $y + 2 = a - \sqrt{w}$ (b) $a = \sqrt{9 - 5w}$

Working: (a)

Add \sqrt{w} to make w positive:
Subtract y and 2 from both sides:
Square both sides:

$$\begin{aligned} y + 2 &= a - \sqrt{w} \\ y + 2 + \sqrt{w} &= a \\ \sqrt{w} &= a - y - 2 \\ w &= (a - y - 2)^2 \end{aligned}$$

The opposite operation of squaring is square rooting.

E.g. 3 Make z the subject: (a) $u = (z + 5)^2$ (b) $x = 1 + z^2$

Working: (a)

Square root both sides:
Subtract 5 from both sides:
New subject on the LHS:

$$\begin{aligned} u &= (z + 5)^2 \\ \sqrt{u} &= z + 5 \\ \sqrt{u} - 5 &= z \\ z &= \sqrt{u} - 5 \end{aligned}$$

E.g. 4 Make z the subject: (a) $2t = 3 - z^3$ (b) $g = 4 - (2z + 3)^6$

Working: (a)

Add z^3 to make z positive:

Subtract $2t$ from both sides:

Cube root both sides:

$$\begin{aligned}2t &= 3 - z^3 \\2t + z^3 &= 3 \\z^3 &= 3 - 2t \\z &= \sqrt[3]{3 - 2t}\end{aligned}$$

Video: [Changing the subject involving brackets, fractions and powers](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p167 M6.6 Qu 1, 2ace..., 3, 4ace..., 5, 6ace..., 7-10

A*-G class textbook: p160 M6.7 Qu 1, 2ace..., 3, 4ace..., 5, 6ace..., 7-10

9-1 homework book: p59 M6.6 Qu 1-10

A*-G homework book: p45 M6.7 Qu 1-10

Summary

Dealing powers (or **I**ndices) is the "**I**" part of **SADMIB** so is one of the last operations to be dealt with.

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The opposite operation of cubing is cube rooting etc.