Changing the subject: the subject appears twice

Use it when you make x the subject and x appears twice.

1 **Clear fractions and brackets**
Multiply both sides by any denominator.
Expand any brackets.

$$y = \frac{x+p}{x+q}$$

$$y(x+q) = x+p$$

$$xy + qy = x+p$$

no fraction or bracket? start at step 2

2 **Every x term**
Every x term on one side, everything else on the other.

$$ax + b = cx + d$$

$$ax - cx = d - b$$

xy is an x term too
$c - dx$ on the other side? add dx to both sides

3 **Factorise**
Take x out as a factor.

$$ax - cx = d - b$$

$$x(a-c) = d - b$$

x on its own leaves a 1: $xy - x = x(y - 1)$

4 **Divide by the bracket**
Divide both sides by the bracket.

$$\boxed{x = \frac{d-b}{a-c}}$$

the whole bracket is the denominator

The Maths Habit

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