

Changing the subject of a formula

Note Title

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- more examples

① Make x the subject of :

$$\frac{x^2}{a} - b = c \quad (\text{first make } x^2 \text{ subject})$$

(+b) (+b)

$$\frac{x^2}{a} = b + c$$

$$\begin{matrix} (x a) \\ x^2 \end{matrix} = \begin{matrix} (x a) \\ a(b+c) \end{matrix}$$

last step: -

$$\begin{matrix} (\sqrt{}) \\ x \end{matrix} = \sqrt{a(b+c)}$$

② Make x the subject of.

$$\frac{x-a}{x+b} = c$$

$$\begin{matrix} \times (x+b) \\ x-a \end{matrix} = \begin{matrix} \times (x+b) \\ c(x+b) \end{matrix}$$

Here the letter ' x ' appears more than once. So we need to get all ' x ' terms on one side and all "non- x " terms on the other side.

$$x - a = cx + bc$$

$$\begin{matrix} (+a) \\ x \end{matrix} = \begin{matrix} (+a) \\ cx + bc + a \end{matrix}$$

$$x = cx + bc + a$$

$$\begin{matrix} (-cx) \\ x - cx \end{matrix} = \begin{matrix} (-cx) \\ bc + a \end{matrix}$$

$$x - cx = bc + a$$

Factorize so that the letter x only appears once

$$x(1-c) = bc + a$$

Divide by the bracket:

$$\underline{\underline{x = \frac{bc + a}{1 - c}}}$$

③ Make x the subject of

$$p = \sqrt{s + \frac{x}{t}}$$

(square both sides)

$$p^2 = s + \frac{x}{t}$$

$$\begin{array}{l} (-s) \quad (-s) \\ p^2 - s = \frac{x}{t} \end{array}$$

$$\begin{array}{l} (xt) \quad (xt) \\ \underline{\underline{t(p^2 - s) = x}} \end{array}$$

④

$$P = \frac{\sqrt{x + Q}}{R}$$

$$\begin{array}{l} (xR) \quad (xR) \\ PR = \sqrt{x + Q} \end{array}$$

(square both sides)

$$(PR)^2 = x + Q$$

$$\begin{array}{l} (-Q) \quad (-Q) \\ P^2R^2 - Q = x \end{array}$$

$$\underline{\underline{P^2R^2 - Q = x}}$$