

CHANGING THE SUBJECT

[CONTENTS](#)

Worked example

Make x the subject:

$$y = x + w$$

$$y = x - z$$

Your turn

Make x the subject:

$$y = x - a$$

$$x = y + a$$

Worked example

Make x the subject:

$$y = 2x$$

$$y = 3x$$

Your turn

Make x the subject:

$$y = 4x$$

$$x = \frac{y}{4}$$

Worked example

Make x the subject:

$$y = \frac{x}{2}$$

$$y = \frac{1}{3}x$$

$$y = \frac{2}{5}x$$

Your turn

Make x the subject:

$$y = \frac{3}{4}x$$

$$x = \frac{4}{3}y$$

Worked example

Make x the subject:

$$y = -x$$

$$y = -2x$$

Your turn

Make x the subject:

$$y = -3x$$

$$x = -\frac{y}{3}$$

Worked example

Make x the subject:

$$y = -\frac{x}{2}$$

$$y = -\frac{1}{3}x$$

$$y = -\frac{2}{5}x$$

Your turn

Make x the subject:

$$y = -\frac{3}{4}x$$

$$x = -\frac{4}{3}y$$

Worked example

Make x the subject:

$$y = \sqrt{x}$$

$$y = \sqrt[3]{x}$$

Your turn

Make x the subject:

$$y = \sqrt[4]{x}$$

$$x = y^4$$

Worked example

Make x the subject:

$$y = 2\sqrt{x}$$

$$y = 5\sqrt[3]{x}$$

Your turn

Make x the subject:

$$y = 3\sqrt[4]{x}$$

$$x = \frac{y^4}{81}$$

Worked example

Make x the subject:

$$y = x^2$$

$$y = x^3$$

Your turn

Make x the subject:

$$y = x^4$$

$$x = \pm \sqrt[4]{y}$$

Worked example

Make x the subject:

$$y = abx$$

$$y = cdex + 2$$

Your turn

Make x the subject:

$$y = fghix - 3$$

$$x = \frac{y + 3}{fghi}$$

Worked example

Make x the subject:

$$y = \frac{x}{ab}$$

$$y = \frac{x}{cde} + 2$$

Your turn

Make x the subject:

$$y = \frac{x}{fghi} - 3$$

$$x = fghi(y + 3)$$

Worked example

Make x the subject:

$$y = 3x + 2$$

$$y = 2x - 3$$

$$y = cx + d$$

Your turn

Make x the subject:

$$y = 5x - 4$$

$$x = \frac{y + 4}{5}$$

Worked example

Make x the subject:

$$y = \frac{x}{3} + 2$$

$$y = \frac{x}{2} - 3$$

$$y = \frac{x}{c} + d$$

Your turn

Make x the subject:

$$y = \frac{x}{5} - 4$$

$$x = 5(y + 4)$$

Worked example

Make x the subject:

$$y = \frac{x + 2}{3}$$

$$y = \frac{x - 3}{2}$$

$$y = \frac{x + d}{c}$$

Your turn

Make x the subject:

$$y = \frac{x - 4}{5}$$

$$x = 5y + 4$$

Worked example

Make x the subject:

$$5y + 6x - 1 = 3x + 5$$

Your turn

Make x the subject:

$$3y + 2x - 5 = 7x + 3$$

$$x = \frac{3y - 8}{5}$$

Worked example

Make x the subject:

$$4x + 5y = 6$$

$$5y - 4x = 6$$

$$-5y - 4x = 6$$

Your turn

Make x the subject:

$$6y - 7x = 8$$

$$x = \frac{6y - 8}{7}$$

Worked example

Make x the subject:

$$3(x - y) = 5x + 1$$

$$2(y - 3x) = 7x + 5$$

Your turn

Make x the subject:

$$3(4y - 5x) = 2x + 1$$

$$x = \frac{12y - 1}{17}$$

Worked example

Make x the subject:

$$A = 5x^2 + \pi x^2$$

$$B = \alpha x^3 - \delta x^3$$

Your turn

Make x the subject:

$$C = \pi x^2 - 3x^2$$

$$x = \pm \sqrt{\frac{C}{\pi - 3}}$$

Worked example

Make x the subject:

$$A = 2\pi r(r + x)$$

$$B = 3cd(d - x)$$

Your turn

Make x the subject:

$$C = 4ef(g - x)$$

$$x = g - \frac{C}{4ef}$$

Worked example

Make x the subject:

$$y = p - 2qx^2$$

$$y = r + 3sx^3$$

Your turn

Make x the subject:

$$y = t - 5ux^3$$

$$x = \sqrt[3]{\frac{(t - y)}{5u}}$$

Worked example

Make x the subject:

$$P = \frac{1}{2}rx^2$$

$$S = \frac{1}{3}tx^3$$

Your turn

Make x the subject:

$$Q = \frac{1}{4}ux^2$$

$$x = \pm \sqrt{\frac{4Q}{u}}$$

Worked example

Make x the subject:

$$(x - 5)^2 = y - 1$$

$$4 - 5y = (x + 2)^3$$

Your turn

Make x the subject:

$$3y - 2 = (x - 5)^2$$

$$x = 5 \pm \sqrt{3y - 2}$$

Worked example

Make x the subject:

$$P = \sqrt{\frac{x + y}{5r}}$$

$$Q = \sqrt[3]{\frac{x - 2y}{3t}}$$

Your turn

Make x the subject:

$$R = \sqrt{\frac{x - 3y}{4u}}$$

$$x = 4uR^2 + 3y$$

Worked example

Make x the subject:

$$ax + ay = cx + by$$

Your turn

Make x the subject:

$$yx + yz = 3xw + 3yw$$

$$x = \frac{3yw - yz}{y - 3w} \text{ or } x = \frac{yz - 3yw}{3w - y}$$

Worked example

Make x the subject:

$$y = \frac{x + 1}{2x}$$

Your turn

Make x the subject:

$$a = \frac{x - 2}{3x}$$

$$x = -\frac{2}{3a - 1}$$

Worked example

Make x the subject:

$$P = \frac{x - 5}{x + 3}$$

$$Q = \frac{2x + 5}{3x - 7}$$

Your turn

Make x the subject:

$$R = \frac{3x - 2}{x + 1}$$

$$x = \frac{R + 2}{3 - R}$$

Worked example

Make x the subject:

$$P = \frac{n^2 - x}{n + x}$$

Your turn

Make x the subject:

$$R = \frac{s^2 + x}{s - x}$$

$$x = \frac{Rs - s^2}{R + 1}$$

Worked example

Make x the subject:

$$\frac{p}{q} = \frac{x}{x - r}$$

Your turn

Make x the subject:

$$\frac{s}{t} = \frac{x + u}{x}$$

$$x = \frac{ut}{s - t}$$

Worked example

Make x the subject:

$$y = 3 + \frac{ax^2}{5}$$

Your turn

Make x the subject:

$$y = 2 + \frac{bx^2}{3}$$

$$x = \pm \sqrt{\frac{3(y-2)}{b}}$$

Worked example

Make x the subject:

$$y = c - \frac{1}{3}\sqrt{x}$$

$$5d - \frac{1}{4}\sqrt[3]{x} = y$$

Your turn

Make x the subject:

$$y = 4e - \frac{1}{5}\sqrt{x}$$

$$x = 25(4e - y)^2$$

Worked example

Make x the subject:

$$\frac{y}{a} + \frac{3y}{x-2} = 5$$

Your turn

Make x the subject:

$$\frac{5p}{x+3} + \frac{p}{b} = 2$$

$$x = \frac{5bp + 3p - 6b}{2b - p}$$

Worked example

Make x the subject:

$$\frac{1}{x} - \frac{1}{y} = \frac{1}{z}$$

Your turn

Make p the subject:

$$\frac{1}{p} + \frac{1}{q} = \frac{1}{r}$$

$$p = \frac{rq}{q - r}$$

Worked example

Make x the subject:

$$\frac{5x}{A} - \frac{b}{c} = \frac{4x - d}{a}$$

Your turn

Make p the subject:

$$\frac{3x}{E} - \frac{f}{g} = \frac{5x - h}{F}$$

$$x = \frac{EfF - Egh}{3fg - 5eg}$$

Worked example

Make x the subject:

$$y = x^2 + 6x - 2$$

$$y = x^2 - 5x + 1$$

Your turn

Make x the subject:

$$y = x^2 + 8x - 3$$

$$x = -4 \pm \sqrt{y + 19}$$

Worked example

Make x the subject:

$$y = 2x^2 + 16x - 2$$

$$y = 3x^2 - 5x + 1$$

Your turn

Make x the subject:

$$y = 2x^2 + 12x - 3$$

$$x = -3 \pm \sqrt{\frac{y + 21}{2}}$$

Worked example

Make x the subject:

$$y = \frac{1}{2}\pi c^3 \sqrt{x^2 - c^4} + 5$$

Your turn

Make x the subject:

$$y = \frac{1}{3}kc^2 \sqrt[3]{x^2 - c^5} - 4$$

$$x = \pm \sqrt{\frac{27(y+4)^3}{k^3 c^6}} + c^5$$