



# Rearranging Formulas

To **rearrange** a formula, you need to use opposite operations to **isolate** a chosen variable.

<b>Examples:</b>	<b>Now you try:</b>
<p><b>Ex 1.</b> Isolate <b>b</b> in <math>d = mt + b</math></p> $d - mt = mt - mt + b$ $\boxed{d - mt = b}$	<p><b>Ex 2.</b> Isolate <b>y</b> in <math>5x + y = 3</math></p>
<p><b>Ex 3.</b> Rearrange to isolate <b>m</b> in <math>y = mx + b</math></p> $y - b = mx + b - b$ $\frac{y - b}{x} = \frac{mx}{x}$ $\boxed{\frac{y - b}{x} = m}$	<p><b>Ex 4.</b> Rearrange to isolate <b>x</b> in <math>y = mx + b</math></p>
<p><b>Ex 5.</b> Isolate <b>t</b> in <math>v = \frac{d}{t}</math></p> $t(v) = \left(\frac{d}{t}\right)t$ $\frac{vt}{v} = \frac{d}{v}$ $\boxed{t = \frac{d}{v}}$	<p><b>Ex 6.</b> Isolate <b>t</b> in <math>a = \frac{v}{t}</math></p>
<p><b>Ex 7.</b> The formula <math>A = \pi r^2</math> is used to solve for the area of a circle. Rearrange the formula so that you're solving for radius.</p> $\frac{A}{\pi} = \frac{\pi r^2}{\pi}$ $\frac{A}{\pi} = r^2$ $\sqrt{\frac{A}{\pi}} = \sqrt{r^2}$ $\boxed{\sqrt{\frac{A}{\pi}} = r}$	<p><b>Ex 8.</b> The formula <math>A = \frac{p^2}{16}</math> relates the area of a square to its perimeter. Rearrange the formula so that you're solving for perimeter.</p>



## Solving Equations with ONE Fraction

1. Clear a fraction by multiplying BOTH sides of the equation by the denominator.
2. If there is more than one fraction, clear them by multiplying both sides of the equation by the LCD (lowest common denominator)

Examples:

<p>Ex 1 Solve for a.</p> $4\left(\frac{a}{4}\right) = (-3)4$ $\boxed{a = -12}$	<p>Ex 2 Solve for b.</p> $4\left(\frac{1}{4}b\right) = (5)4$ $1b = 20$ $\boxed{b = 20}$
<p>Ex 3 Solve for c.</p> $5(-6) = \left(\frac{3c}{5}\right)5$ $\frac{-30}{3} = \frac{3c}{3}$ $\boxed{-10 = c}$	<p>Ex 4 Solve for d.</p> $-3\left(\frac{4d+2}{-3}\right) = (6)(-3)$ $4d+2 = -18$ $4d+2-2 = -18-2$ $\frac{4d}{4} = \frac{-20}{4}$ $\boxed{d = -5}$

### Practice Solving Equations with ONE Fraction

1.  $\frac{t}{-3} = 6$

2.  $\frac{-2}{7}x = 6$

3.  $-5 = \frac{-4x}{6}$

4.  $\frac{-3m-8}{8} = -5$



## Solving Equations with TWO Fractions

1. Clear a fraction by multiplying BOTH sides of the equation by the denominator.
2. If there is more than one fraction, clear them by multiplying both sides of the equation by the LCD (lowest common denominator)

<p>Ex 5 Solve for e.</p> $12\left(\frac{3}{4}e\right) = \left(\frac{2}{3}\right) 12$ $3(3e) = 4(2)$ $\frac{9e}{9} = \frac{8}{9}$ $e = \frac{8}{9}$	<p>Try these:</p> <p>a)</p> $\frac{2}{3} = -\frac{3t}{5}$	<p>b)</p> $\frac{-5}{6}x = \frac{3}{4}$	<p>c)</p> $\frac{3x}{4} = \frac{1}{2}$
<p>Ex 6 Solve for f.</p> $10\left(2f - \frac{3}{5}\right) = \left(\frac{1}{2}\right) 10$ $20f - 3(2) = 5$ $20f - 6 = 5$ $\frac{20f}{20} = \frac{11}{20}$ $f = \frac{11}{20}$	<p>d)</p> $\frac{1}{4} + \frac{1t}{2} = 4$	<p>e)</p> $y - \frac{2}{5} = -\frac{1}{3}$	<p>f)</p> $\frac{1}{4}x + x = -3 + \frac{1}{2}x$



Ex 7 Solve for g.

$$5\left(\frac{2}{5}(g-2)\right) = (-3)5$$

$$2(g-2) = -15$$

$$2g - 4 = -15$$

$$2g = -15 + 4$$

$$\frac{2g}{2} = \frac{-11}{2}$$

$$g = \frac{-11}{2}$$

Try these:

a)  $\frac{2}{3}(3x+1) = 5$

b)  $\frac{3}{4}(2x+1) = 2$

c)  $\frac{3}{4}(2x+1) = \frac{2}{3}(x-5)$

Ex 8 Solve for h.

$$15\left(\frac{k+2}{3}\right) = \left(\frac{k-4}{5}\right)15$$

$$5(k+2) = 3(k-4)$$

$$5k + 10 = 3k - 12$$

$$5k - 3k = -12 - 10$$

$$\frac{2k}{2} = \frac{-22}{2}$$

$$k = -11$$

d)  $\left(\frac{3x+4}{5}\right) = \left(\frac{x}{6}\right)$

e)  $\left(\frac{y+2}{9}\right) = \left(\frac{y-3}{3}\right)$

f)  $\left(\frac{3c-2}{4}\right) = \left(\frac{2c-1}{3}\right)$