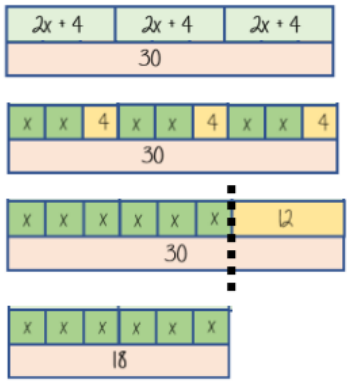
Solve equations R

$3(2x + 4) = 30$



$3(2x + 4) = 30$

Expand the brackets

$6x + 12 = 30$

$-12 \quad -12$

$6x = 18$

$\div 6 \quad \div 6$

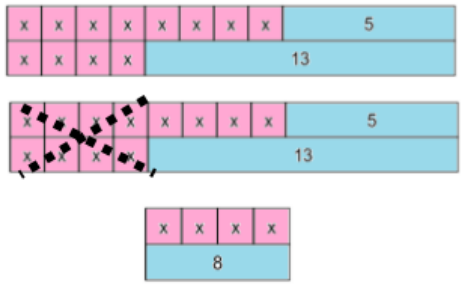
$x = 3$

Substitute to check your answer. This could be negative or a fraction or decimal

x
3

Equations: unknown on both sides R

$8x + 5 = 4x + 13$



$8x + 5 = 4x + 13$

$-4x \quad -4x$

$4x + 5 = 13$

$-5 \quad -5$

$4x = 8$

$\div 4 \quad \div 4$

$x = 2$

Inequalities with unknown on both sides

Solving inequalities has the same method as equations

$5(x + 4) < 3(x + 2)$

$5x + 20 < 3x + 6$

$2x + 20 < 6$

$2x < -14$

$x < -7$

Check it!

$5(-8 + 4) < 3(-8 + 2)$

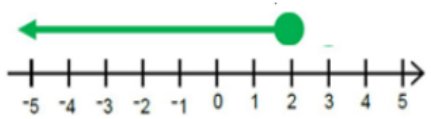
$5(-4) < 3(-6)$

$-20 < -18$

✓ -20 IS smaller than -18

Inequalities: unknown on both sides

$8x + 5 \leq 4x + 13 \longrightarrow x \leq 2$



Any value 2 or less will satisfy this inequality

Form and solve inequalities R

Two more than treble my number is greater than 11

Form

x → x3 → +2 → 11

$3x + 2 > 11$

Solve

x ← -3 ← -2 ← 11

$x > 3$

Substituting in an expression

$x = 2y$

$x + y = 30$

Pair of simultaneous equations (two representations)

Substitute $2y$ in place of the x variable as they represent the same value

$x = 2y$ $\quad x + y = 30$

$3y = 30$

$\div 3 \quad \div 3$

$y = 10$

$x = 2y$

$x = 20$

Solve by addition

$$3x + 2y = 16$$
$$+ 6x - 2y = 2$$
$$9x = 18$$
$$\div 9 \quad \div 9$$
$$x = 2$$
$$3x + 2y = 16$$
$$3(2) + 2(y) = 16$$
$$6 + 2y = 16$$
$$-6 \quad -6$$
$$2y = 10$$
$$y = 5$$

Addition makes zero pairs

$= 16$

$= 2$

$= 18$

$x = 2$

$y = 5$

Solve by subtraction

$$3x + 2y = 18$$
$$- \quad x + 2y = 10$$
$$2x = 8$$
$$\div 2 \quad \div 2$$
$$x = 4$$
$$x + 2y = 10$$
$$(4) + 2y = 10$$
$$-4 \quad -4$$
$$2y = 6$$
$$\div 2 \quad \div 2$$
$$y = 3$$

$x = 4$

$y = 3$

$= 18$

$= 10$

$= 18$

$= 10$

$= 8$

$= 4$

$= 3$

Iteration

Starting with $x_0 = 0$ use the iteration formula $x_{n+1} = \frac{2}{x_n^2 + 3}$

3times to find an estimate to the solution.

Calculate the values of x_1, x_2, x_3 to find an estimate for the solution to $x^3 + 3x = 2$

$x_{0+1} = \frac{2}{0^2+3} = 0.\dot{6}$

We substitute this into the next step

$x_{1+1} = \frac{2}{0.6\dot{2}+3} = 0.5806451613$

$x_{2+1} = \frac{2}{(0.58\ldots)^2+3} = 0.5993140006$

An estimate of the solution is 0.6 because all of the solutions round to 1d.p

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