# Reducing Equations to a simpler form

There are some equations that are complex but can be reduced to a simpler form.

**For example:** Solve $\frac{6x+1}{3} + 1 = \frac{x+1}{3}$

**Solution:**

Multiplying both sides by 6, we get

$\frac{6x+1}{(3+1)} \times 6 = \frac{x+1}{(3)} \times 6$

$2(6x + 1) + 6 = x - 3$

$12x + 2 + 6 = x - 3$

$12x + 8 = x - 3$

$12x - x + 8 = -3$

$11x + 8 = -3$

$11x = -3 - 8$

$11x = -11$

$x = -1$

**Example:** Solve $5x - 2(2x - 7) = 2(3x - 1) + \frac{9}{2}$

**Solution:**

LHS $= 5x - 4x + 14 = x + 14$

RHS $= 6x - 2 + \frac{9}{2} = 6x - \frac{4}{2} + \frac{9}{2} = 6x + \frac{5}{2}$

Now,

$x + 14 = 6x + 2 + \frac{5}{2}$

$14 - \frac{5}{2} = 6x - 3$

$\frac{28-5}{2} = 5x$

$\frac{23}{2} = 5x$

$\frac{23}{10} = x$

So, $x = 2.3$