Objective 1: To begin to understand how to re-arrange equations to "make x the subject"

Objective 2: To understand that a factorisation may be required

Work across the tables

Make x the subject in the following expressions:

Part 1 (a):

$ax + b = 5$	$ax - g = q$
$y = mx + c$	$4x + r = y$
$y = 3x + 2$	$abx = t + b$

Part 1 (b):

$x + t = q$	$x - p = a + p$	$x - t - aq = g + p$
$3x = d$	$5x = y + c$	$ax + b = c + d$
$t = ax + p$	$t - x = q$	$5x = g + 2x$
$dx - h = q$	$a(x + 3) = t$	$a(x + q) = t + 3$
$a(x + y) + j = k$	$a(x - y) = 0$	$g + a(x + y) = t - q$

Part 3:

$\frac{x}{a} = p$	$\frac{x}{g} = h + p$	$\frac{x}{k} - p = g$
$\frac{dx}{h} = p$	$\frac{x}{l} = l$	$\frac{x}{2} + \frac{h}{3} = \frac{p}{6}$
$\frac{x}{j} + 3g = q^2$	$C = 2\pi x$	$A = \frac{1}{2}hx$
$v^2 = u^2 + 2ax$	$\frac{h}{x} = p$	$s = ut + \frac{1}{2}xt^2$

Extension:

Part 4: Requiring factorising

$2x + 5x = a$	$ax + bx = d$	$ax + bx = f + g$
$ax - bx = h$	$ax - bx + g = h$	$ax + g = bx + p$
$a(x + p) = p(x + q)$	$x(a + b) = xg + t$	$p - ax = t + qx$
$x = bx + t$	$ax + bx + cx = y$	$\frac{q + x}{x} = b$

Learning Objective: Re-arrangements involving loads of fractions…enjoy!

In all the following, make x the subject

$\frac{x}{a} = t$	$\frac{ax}{b} = q$
$\frac{ax}{y} = y$	$\frac{t}{x} = f$
$\frac{x-a}{b} = c$	$f = \frac{sx}{t}$

$\frac{x}{2} + \frac{b}{3} = c$	$\frac{x}{5} + t = \frac{q}{10}$
$\frac{x}{a} + 5 = \frac{1}{3}$	$\frac{x}{a} = \frac{b}{c}$
$x + \frac{t}{3} = q$	$\frac{x+a}{b} = t$
$\frac{x+a}{b} = \frac{ax}{b}$	$\frac{x}{c} + t = \frac{q}{c}$
$\frac{x}{a} - \frac{b}{a} = x$	$\frac{5}{ax} = t$
$\frac{ax+b}{3} = \frac{g}{2}$	$\frac{1}{x} = \frac{1}{a} + t$
$\frac{ax+b}{x} = c$	$\frac{bx}{c} = l + x$

Learning Objective: To begin to re-arrange more involved expressions which may involve powers and roots

Make x the subject in the following expressions

Part 1 – Square roots required (don't forget the $\pm$)

$x^2 = b$	$x^2 + c = d$	$ax^2 + c = f$
$fx^2 - g = t + p$	$\frac{x^2}{a} = g$	$\frac{fx^2}{t} = y$
$\frac{x^2}{d} - e = f$	$\frac{ax^2}{b} = b$	$(x + t)^2 + g = h$
$a(x - y)^2 + d = f$	$\frac{5}{x^2} = g$	$\frac{a}{x} = x$

Part 2 – Squares required (be careful to consider which terms are under the square root)

$\sqrt{x} = t$	$\sqrt{x + b} = q$	$\sqrt{ax} = r$
$\sqrt{ax + t} = y$	$\sqrt{x} - r = q$	$\sqrt{ax} + d = g$
$a\sqrt{x} = q$	$\frac{\sqrt{x}}{p} = t$	$a\sqrt{x - q} = g$
$\frac{\sqrt{x + b}}{t} = a$	$g + \sqrt{ax} = f$	$\frac{1}{\sqrt{x - y}} = q$

Part 3: A mix of tricky problems involving a range of techniques

$\frac{ax + b}{gx - d} = g$	$V = \frac{1}{3}\pi r^3$ Make r the subject
$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ Make u the subject	Expand $(x + a)^2$ Hence make x the subject in the following expression $x^2 + 2ax + a^2 = r$