Changing the Subject of Equations

i. **Make x the subject of each of the following expressions**

- $q = 3x$
- $r = 10x + 5$
- $s = x/2$
- $t = \sqrt{9x + 3}$
- $u = \dfrac{3}{x}$
- $w = 12\sqrt{x}$
- $v = \rho x$, where ρ is a constant
- $z = \dfrac{10x}{14} + 3$

ii. **Change the subject of each of the following equations to the letter given in brackets**

- $m = dv \quad (v)$
- $s = 14t + 3 \quad (t)$
- $y^2 = 4w + 3 \quad (w)$
- $v = u + at \quad (t)$
- $s = ut + \frac{1}{2}at^2 \quad (u)$
- $C = 2\pi r \quad (r)$
- $T = 100h + 45 \quad (h)$
- $v^2 = u^2 + 2as \quad (u)$

iii. **Change the subject of each of the following equations to the letter given in brackets (more tricky!)**

- $A = \pi r^2 \quad (r)$
- $A = \frac{1}{2}(a + b)h \quad (b)$
- $F = \frac{9}{5}C + 32 \quad (C)$
- $A = \pi r^2 h \quad (h)$
- $V = \frac{4}{3}\pi r^3 \quad (r)$
- $x = \dfrac{-b + \sqrt{b^2 - 4ac}}{2a} \quad (c) \quad$ *Extra tricky!*