Composite Functions

Find an expression for $fg(x)$ for each of these functions:

(a) $f(x) = x - 1$ and $g(x) = 5 - 2x$

(b) $f(x) = 2x^2$ and $g(x) = x + 3$

Find an expression for $gf(x)$ for each of these functions:

(a) $f(x) = 2x + 1$ and $g(x) = 4x + 3$

(b) $f(x) = \frac{3}{x}$ and $g(x) = 2x - 1$

The function f is such that $f(x) = 2x - 3$

(i)   Find $ff(2)$

(ii)   Solve the equation $ff(x) = x$

Functions f and g are such that

$f(x) = x^2$ and $g(x) = 5 + x$

(a) Find (i) $fg(x)$ (ii) $gf(x)$

(b) Solve $fg(x) = gf(x)$

The function g is such that

$g(x) = \frac{1}{1-x}$ for $x \neq 1$

(a)   Prove that $gg(x) = \frac{x-1}{x}$

(b)   Find $ggg(3)$

Functions f, g and h are such that

$f(x) = 3 - x$

$g(x) = x^2 - 14$ and

$h(x) = x - 2$

Given that $f(x) = gfh(x)$, find the values of x.