Finding Expressions for Transformed Functions

(a) Given that $f(x) = x + 5$, find an expression for $f(4x)$

(b) Given that $g(x) = \sqrt{x}$, find an expression for $g(x - 3)$

(c) Given that $h(x) = \frac{x}{2}$, find an expression for $h(x^2)$

(a) $f(4x) = 4x + 5$

(b) $g(x-3) = \sqrt{x-3}$

(c) $h(x^2) = \frac{x^2}{2}$

(a) Given that $f(x) = 3x + 7$, find an expression for $f(x + 1)$

(b) Given that $g(x) = x^2 - 4$, find an expression for $g(2x)$

(c) Given that $h(x) = \frac{1}{3x}$, find an expression for $h(x - 4)$

(a) $f(x+1) = 3x + 10$

(b) $g(2x) = 4x^2 - 4$

(c) $h(x-4) = \frac{1}{3x-12}$

(a) Given that $f(x) = x^2 + 2x - 1$, find an expression for $f(3x)$

(b) Given that $g(x) = \frac{x}{x+1}$, find an expression for $g(x + 5)$

(c) Given that $h(x) = \frac{x}{2} - 3$, find an expression for $h(11 + 4x)$, giving your answer in the form $ax + b$, where a and b are constants.

(a) $f(3x) = 9x^2 + 6x - 1$

(b) $g(x+5) = \frac{x+5}{x+6}$

(c) $h(11+4x) = \frac{11+4x}{2} - 3$

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

(a) Given that $f(x) = 5 - 4x$, solve $f(x + 1) = 3$

(b) Given that $g(x) = x - 10$, solve $g(x^2) = 3x$

(c) Given that $h(x) = x^2$, solve $h(2x + 1) - h(x - 3) = 15x$

(a) $5 - 4(x+1) = 3$
$1 - 4x = 3$
$x = -\frac{1}{2}$

(b) $x^2 - 10 = 3x$
$x^2 - 3x - 10 = 0$
$(x-5)(x+2) = 0$
$x = 5, x = -2$

(c) $(2x+1)^2 - (x-3)^2 = 15x$
$3x^2 + 10x - 8 = 15x$
$\leftarrow 3x^2 - 5x - 8 = 0$

$x = \frac{8}{3}, x = -1$