Functions

In the following questions, f, g and h, p and q are the functions:

f: $x \to 3x + 4$, g: $x \to x^2 - 1$ h: $x \to 18 - x$ p: $x \to \frac{12}{x-1}$ q: $x \to x^2 + 2x$

1) Evaluate the following:

(a) f(5) (b) g(4) (c) h(7) (d) p(½) (e) q(–5) (f) g(–4) (g) h(9) (h) q(–2)
(i) fg(2) (j) gf(2) (k) fh(10) (l) gp(2) (m) pq(1) (n) qp(1) (o) ff(5) (p) hh(7)

2) (a) Which number must be excluded from the domain of p?
(b) If the domain of g is all numbers, what is the range of g?
(c) If the domain of f is $1 \le x \le 5$, what is the range of f?

3) Write down the following, simplifying as much as possible:

(a) g(t) (b) f(y – 5) (c) f(y) – 5 (d) g(t + 4) (e) g(t) + 4 (f) p(x – 3)
(g) p(x) – 3 (h) f(2x) (i) 2f(x) (j) p(3x) (k) 3p(x) (l) q(5x)
(m) g(–x) (n) –g(x) (o) h(–x) (p) –h(x) (q) f(2x+1)–5 (r) q(x–3) + 4