1. Solve

   (a) $\frac{1}{2}(x-3) \le x+6$ or $4x-9 \le \frac{1}{3}(x+7)$.

   (b) $x^2 - 4x - 77 \ge 0$.

   (c) $\frac{4x-3}{x+6} \ge 2$.

   (d) $|x-1| + |2x+4| = 10$.

   (e) $|x^2 - 2x| \ge 3$.

   (f) $|3|x-1| + 2| < 7$.

   (g) $x^2 + 2|x-2| - 11 \le 0$

2. Let α and β be the roots of the quadratic equation $x^2 - 2(k+1)x + 2(k-1) = 0$, where k is a real number.

   (a) Prove that α and β are real and unequal.

   (b) Express $(\alpha - 5)(\beta - 5)$ in terms of k.

   (c) (i) If $\alpha < 5 < \beta$, show that $k > \frac{13}{8}$.

   (ii) If in addition that $\frac{1}{\alpha} + \frac{1}{\beta} > 2$, find the possible integral value of k.