3 $f(x) = x^2 + (k+3)x + k$. (2)

a) Discriminant:

$\Delta = (k+3)^2 - 4k$.

$= k^2 + 9 + 6k - 4k$

$= k^2 + 2k + 9$

b) $(k+1)^2 - 1 + 9$

$(k+1)^2 + 8$.

c) $f(x) = 0$ has real roots iff.

$\Delta \geq 0$ ie $(k+1)^2 + 8 > 0$.

$(k+1)^2 > 0$ $(k+1)^2 + 8 > 0$.

$\therefore f(x)$ has real roots.