36. $(-a)\cdot(-a) = a\cdot a$ (Transitivity of eq on 21, 35)

37. $a^2 = a\cdot a$ (By defn.) 38. $a\cdot a = a^2$ (Symmetry of eq 37)

39. $(-a)\cdot(-a) = a^2$ (Transitivity of eq on 37, 38)

40. $a^2 > 0$ (Substitution of eq 39 on 18)

$\therefore$ Square of any non-zero real no. is positive

b). 1. $1 \in \mathbb{R}$ (Given) 2. $1 \neq 0$ (M3) 3. $1^2 > 0$ (By part a)

4. $1^2 = 1\cdot 1$ (By defn.) 5. $1\cdot 1 = 1$ (M3) 6. $1^2 = 1$ (Transitivity of eq on 4, 5)

7. $1 > 0$ (Substitution of eq 6 in 3)

c) 1. The proof will be by mathematical induction on $n$.

2. $\boxed{\text{Base Case:}}$ $1 > 0$ (holds by part b), or $1 \in P$ (by defn.)

3. $\boxed{\text{Inductive Step:}}$ Let $n > 0$ hold, for some $n \in \mathbb{N}$, i.e. $n \in P$ (by defn.)

$\therefore n+1 \in P$ (Prop 2.1.5 (i)), or $(n+1) > 0$ (By defn.)

$\therefore$ The assertion is true for all natural no.s