

# 6.

- a)  $\pi, y$  are positive real numbers. Some  $y$  belong to  $0 < y < \pi$  for some number  $\pi$ , for every number  $y$ . when square of some  $y$  in  $0 < y < \pi$  are smaller than  $\pi$  in  $y < \pi$ , Many  $y$  exist under the same conditions. For example, when  $\pi = 4, y = 2$ , it satisfies  $\pi \leq y^2$ . but if the range of  $y$  is  $0 < y < 2$ , these don't satisfy  $\pi \leq y^2$ . so  $\exists x \forall y (\pi \leq y^2)$  is false.
- b) If  $\pi = 0$ ,  $y^2$  is always same or greater than 0.  $\exists x \forall y (\pi \leq y^2)$  is true.
- c) If  $\pi < 0$ ,  $y^2$  is always greater than 0.  $\exists x \forall y (\pi \leq y^2)$  is true.