Determine the truth of each statement:

Let $R$ be the real numbers

1) $\{\exists x \in R, \exists y \in R \mid y = x^2\}$ (True)

2) $\{\forall x \in R, \exists y \in R \mid y = x^2\}$ (True)

3) $\{\exists x \in R \mid \forall y \in R, y = x^2\}$ (False)

4) $\{\forall x \in R, \forall y \in R, y = x^2\}$ (False)

Sentences for the above:

1) There is a particular $x$ and a particular $y$ so that $y = x^2$.

2) For any $x$ value there will be a $y$ value so that $y = x^2$.

3) There is at least one $x$ value so that for any $y$ value you will have $y = x^2$.

4) For each $x$ and any $y$, it is true that $y = x^2$. 