Quiz 2, Spring 2009, Professor Warnow

Consider the following sets:

- $S_1 = (0, \infty)$
- $S_2 = (-\infty, 0)$
- $S_3 = \{0, 1, 2\}$
- $S_4 = \emptyset$

For each statement, determine if the statement is true for each of the sets given above (i.e., let $X = S_i$ for each $i = 1, 2, 3, 4$, and determine if the statement is true or false). Do not provide any proof - just say True or False.

Give your answers in a 4x6 matrix.

1. $\forall x \in X, \exists y \in X \ s.t. \ x < y$
2. $\exists y \in X \ s.t. \ \forall x \in X - \{y\}, x < y$
3. $\exists A \subseteq X \ s.t. \ \forall y \in A, \exists z \in X - A, \ y < z.$
4. $\forall A \subseteq X, \forall y \in A, \exists z \in X - A \ s.t. \ y < z$
5. $\exists A \subseteq X$ s.t. $\exists z \in X - A \forall y \in A, y < z.$
6. $\forall A \subseteq X, \exists z \in X - A \ s.t. \ \forall y \in A, y < z$