Math 131 - Dr. Miller - HW: Practice with Set Notation - Due Friday, Oct. 3, 2014

Attach this page at the back of your homework problems from the text.

For this entire assignment, let \( X = \{ \Diamond, *, $, 0, \{ k, 2 \}, \text{Ohio} \} \).

1. Fill in each blank with the symbol \( \in \) or \( \notin \); JUSTIFY your claim:

\[
\begin{align*}
0 & \in X \quad \text{because 0 is offset by commas in X's roster.} \\
\Diamond & \notin X \\
0 & \notin X \\
\text{Ohio} & \in X \\
\{ \text{Ohio} \} & \notin X \\
k & \notin X
\end{align*}
\]

2. Now fill in each blank with either the symbol \( \subseteq \) or \( \supseteq \); JUSTIFY your claim:

\[
\begin{align*}
0 & \subseteq X \quad \text{because 0 is not a set at all, let alone one whose elements all belong to X.} \\
\Diamond & \notin X \\
0 & \subseteq X \\
\text{Ohio} & \notin X \\
\{ \text{Ohio} \} & \subseteq X \\
\{ k, 2 \} & \not\subseteq X
\end{align*}
\]

3. Perform the following tasks involving subsets of \( X \).

(a) Use correct listing notation to write a subset \( Y \) of \( X \) for which \( n(Y) = 2 \).

\[
Y = \{ *, $ \}
\]

(b) Write two distinct (just means “not equal”) subsets of \( X \) that each have a cardinality of 4.

\[
\begin{align*}
\{ \Diamond,*, $, 0 \} \\
\{ *, *, $, 0 \}
\end{align*}
\]

(c) List as many subsets as possible that contain * and $ but not \( \Diamond \) and not \( \{ k, 2 \} \).

\[
\begin{align*}
\{ *, $ \} \\
\{ *, $, 0 \} \\
\{ *, *, $, 0 \} \\
\{ *, *, $, \text{Ohio} \} \\
\{ *, *, $, 0, \text{Ohio} \}
\end{align*}
\]

\[
\begin{align*}
\{ *, \Diamond, $, \text{Ohio} \} \\
\{ *, \Diamond, $, 0, \text{Ohio} \}
\end{align*}
\]