HW 3.1

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8. For each of the sets in Exercise 7, determine whether 2 is an element of that set.

a) $\{x \in \mathbf{R} | x$ is an integer greater than $1\}$
No
b)$\{x \in \mathbf{R} | x$ is the square of an integer$\}$
No
c)$\{2, \{2\}\}$
Yes
d)$\{\{2\}, \{\{2\}\}\}$
Yes
e)$\{\{2\}, \{2, \{2\}\}\}$
Yes
f)$\{\{\{\{2\}\}\}\}$
No

10. Determine whether each of these statements are true or false.

a) True
b) True
c) False
d) True
e) True
f) True
g) False

14. Use a Venn diagram to illustrate the relation $A \subseteq B$ and $B \subseteq C$.
See attached figure.

18. Find two sets A and B such that $A \in B$ and $A \subseteq B$.

$A = \{1\}, B = \{1, \{1\}\}$

20. What is the cardinality of each of these sets?

a) 0
b) 1
c) 2
d) 3

32. Let A = {a,b,c},B = {x,y} and C = {0,1}. Find:

a) A x B x C
$\{(a,x,0),(a,x,1),(a,y,0),(a,y,1),(b,x,0),(b,x,1),(b,y,0),(b,y,1),(c,x,0),(c,x,1),(c,y,0),(c,y,1)\}$
b) C x B x A
$\{(0,x,a),(0,x,b),(0,x,c),(1,x,a),(1,x,b),(1,x,c),(0,y,a),(0,y,b),(0,y,c),(1,y,a),(1,y,b),(1,y,c)\}$
c) C x A x B
$\{(0,a,x),(0,a,y),(0,b,x),(0,b,y),(0,c,x),(0,c,y),(1,a,x),(1,a,y),(1,b,x),(1,b,y),(1,c,x),(1,c,y)\}$
d) B x B x B
$\{(x,x,x),(x,x,y),(x,y,x),(x,y,y),(y,x,x),(y,x,y),(y,y,x),(y,y,y)\}$