CSCI 301, Winter 2018
Math Exercises # 1

Thomas Jones-Moore

Due date: Extended to January 29th, 2018.

Exercises for Section 1.1

C. Find the following cardinalities

30. $|\{\{1,4\},a,b,\{\{3,4\}\},\{\emptyset\}\}|$

Answer: The cardinalitie for the above problem is 5.

Exercises for Section 1.3

A. List all the subsets of the following sets.

8. $\{\{0,1\},\{0,1,\{2\}\},\{0\}\}$

Answer: $\{\{\},\{0,1\}\}$, $\{\{0,1,\{2\}\}\}$, $\{\{0\}\}$, $\{\{0,1\},\{0,1,\{2\}\}\}$, $\{\{0,1\},\{0\}\}$, $\{\{0,1,\{2\}\},\{0\}\}$, $\{\{0,1\},\{0,1,\{2\}\},\{0\}\}$.

Exercises for Section 1.4

A. Find the indicated sets.

12. $\{X \in \mathcal{P}(\{1,2,3\}) : 2 \in X\}$

Answer: $\{\{\},\{1\},\{2\},\{3\},\{1,2\},\{1,3\},\{2,3\},\{1,2,3\}\}$

B. Suppose that $|A| = m$ and $|B| = n$. Find the following cardinalities.

18. $|\mathcal{P}(A \times \mathcal{P}(B))|$

Answer: $2^m \cdot 2^{2^n}$

Exercises for Section 2.10 Negate the following sentences.

8. If x is a rational number and $x \neq 0$, then $\tan(x)$ is not a rational number.

Answer: Suppose $x = \frac{1}{9}$. $\tan(\frac{1}{9}) = .1115706...$, therefor when x is rational, $\tan(x)$ can be rational too.