Math 2001 - Assignment 1

Due January 26, 2018

(1) Are the following true for $A = \{1, \{2, 3\}\}$ or not?
   (a) $\{2, 3\} \in A$ (b) $\{2, 3\} \subseteq A$ (c) $\emptyset \in A$ (d) $|A^2| = 9$.
(2) [1, Section 1.1]: Exercises 1,12,15
(3) [1, Section 1.1]: Exercises 19,24,26
(4) [1, Section 1.1]: Exercises 29,38
(5) Let $A = \{0, 1\}$ and $B = \{a, b, c\}$. Enumerate:
   (a) $B \times A$ (b) $B \times \emptyset$ (c) A^3
(6) Sketch the following Cartesian products in the plane $\mathbb{R}^2$. Be careful to denote whether the boundaries of your figures are contained in the sets or not (Use dashed lines for boundaries that are not included, solid lines for boundaries that are included).
   (a) $\{1, 2\} \times \{0, 1, 2\}$ (b) $[0, 2] \times (1, 2]$ (b) $\mathbb{R} \times \mathbb{Z}$

References

[1] Richard Hammack. The Book of Proof. Creative Commons, 2nd edition, 2013. Available for free: `http://www.people.vcu.edu/~rhammack/BookOfProof/`