

## Lab for Section 2.2

Use good notation and show appropriate work. Write explanations in *complete sentences*.

1. The fifty-two offices in an office complex are each connected by a secure communications cable to ensure the privacy and security of the data sent and conversations between individual employees. How many separate cables are there? (*Write the solution in a complete sentence.*)
  
2. List the set of all of the subsets of  $\{0, 1, 2\}$ . Use good notation.
  
3. Assume  $A$  is a set such that  $n(A) = 6$ .
  - (a) Determine the number of distinct subsets of  $A$  that exist.
  
  - (b) Determine the number of different proper subsets of  $A$ .
  
  - (c) Using Pascal's Triangle (without proof - see page 53), how many different subsets of cardinality three can be formed choosing elements from  $A$ ?
  
4. Classify each by writing *true* or *false*.
  - (a)  $\{a, b, c\} = \{b, c, a\}$
  
  - (b)  $n(\{a, b, c\}) = n(\{1, 2, 3\})$
  
  - (c)  $\{b\} \in \{a, b\}$
  
  - (d)  $\{0, 1\} \subset \{0, \{0, 1\}, 2\}$  (Caution)
  
  - (e)  $\{0, 2\} \subseteq \{0, \{0, 1\}, 2\}$
  
  - (f)  $\{2, 4, 6\}$  and  $\{4, 6, 8\}$  are equivalent sets.
  
  - (g)  $\{\emptyset\}$  and  $\{0\}$  are equivalent sets.

5. For the following questions, consider the set of the students in today's class. *When asked to state a set use either set-builder notation or list/roster form. State the solutions to (d), and (e) in complete sentences.*

(a) State a subset of this set.

(b) State a proper subset of this set that has three elements.

(c) (i) State a set that is equivalent to the set in part (b) that does not use students from this class.

(ii) State a set that is equal to the set in part (b) that does not use students from this class.

(d) How many different study groups could be formed? Also, classify the problem type.

(e) How many different study groups of size 4 could be formed? Also, classify the problem type.