Math 170- Worksheet 6.1-6.2

Problem 1) Let $U = \{0, 1, 2, \ldots, 10\}$ be the universal set. $A = \{0, 2, 4, 6, 8\}, B = \{1, 3, 5, 7\}$ and $C = \{2, 8, 4\}$. For each of the following sets, (i) list the elements and (ii) determine the cardinality of the given set.

(a) $A \cup B$

(b) $A \cap C$

(c) $B \cap C$

(d) $A \cap A'$

(e) $A \cap (B \cup C)$

(f) $A \cap B \cap C$

Problem 2) Let $U = \{1, 2, 3, 4, 5\}$ be our universal set. Let $A = \{1, 2, 3\}$ and $B = \{2, 4\}$. For each of the following sets, (i) list the elements and (ii) determine the cardinality of the given set.

(a) $A \times B \times A$

(b) $(A \times B) \cap (B \times B)$

(c) $(A \cap B) \times A'$

Problem 3) Let S be the set of outcomes when two distinguishable 6-sided dice are rolled. Let $E \subseteq S$ be the set in which at least one die shows an even number, and let $F \subseteq S$ be the set of outcomes in which at least one die shows an odd number. List the elements in each of the following subsets of S.

(a) E'

(b) $E \cup F$

(c) $E' \cup F'$

(d) $(E \cap F)'$

(e) $E' \cap F'$

Problem 4) In November 2011, a Google search for "asteroid" yielded 25 million hits. A search for "comet" on Google yielded 93.5 million hits. A search for both "asteroid" and "comet" yielded 3.1 million hits. How many hits contained "asteroid", "comet", or both?

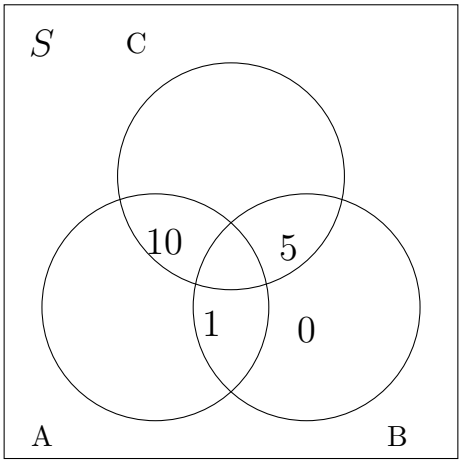
Problem 5) The dining hall offers a total of 14 desserts, of which 8 have ice cream as a main ingredient and 9 have fruit as a main ingredient. Assuming that all of them have either ice cream, fruit, or both a a main ingredient, how many have both?

Problem 6) In a study of Tibetan children, a total of 1556 children were examined. Of these, 615 had cavities. Of the 1313 children living in non-urban areas, 504 had cavities.

(a) How many children living in urban areas had cavities?

(b) How many children living in urban areas did not have cavities?

Problem 7) Using the information given, complete the following venn diagram: $|A| = 16, |B| = 11, |C| = 30$, and $|S| = 40$. [**Note:** S is the universal set.]



Problem 8) Of the 4700 students at Medium Suburban College (MSC), 50 play soccer, 60 play lacrosse, and 96 play football. Only 4 students play both soccer and locrosse, 6 play soccer and football, and 16 play both lacrosse and football. No students play all three sports.

(a) Set up and complete the venn diagram.

(b) How many students play no sports?

(c) How many students play only soccer?