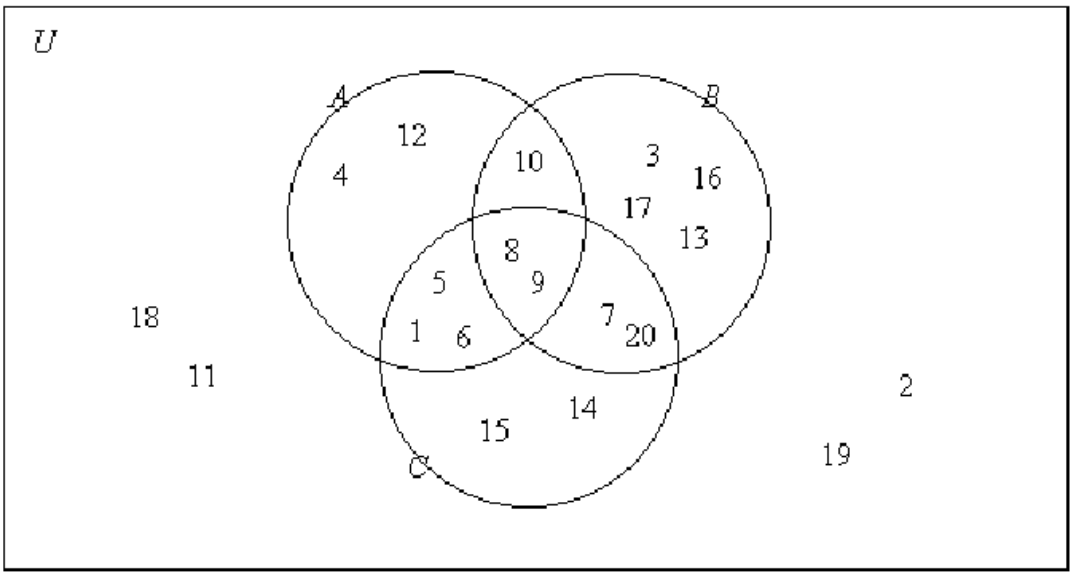
1. Consider the sets A, B, and C described by the Venn Diagram, which shows the elements in each region:



Find each of the following:

(a) $A = \{1, 4, 5, 6, 8, 9, 10, 12\}$

(b) $B = \{3, 7, 8, 9, 10, 13, 16, 17, 20\}$

(c) $C = \{1, 5, 6, 7, 8, 9, 14, 15, 20\}$

(d) $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

(e) $n(A) = 8$

(f) $A' = \{2, 3, 7, 11, 13, 14, 15, 16, 17, 18, 19, 20\}$

(g) $A \cup B = \{1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 16, 17, 20\}$

(h) $n(A \cup B) = 14$

(i) $(A \cup B)' = \{2, 11, 14, 15, 18, 19\}$

(j) $A \cup C = \{1, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 20\}$

(k) $B \cup C = \{1, 3, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20\}$

(l) $A \cup B \cup C = \{1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 20\}$

(m) $n(A \cup B \cup C) = 16$

(n) $A \cap B = \{8, 9, 10\}$

(o) $A \cap C = \{1, 5, 6, 8, 9\}$

(p) $B \cap C = \{7, 8, 9, 20\}$

(q) $n(B \cap C) = 4$

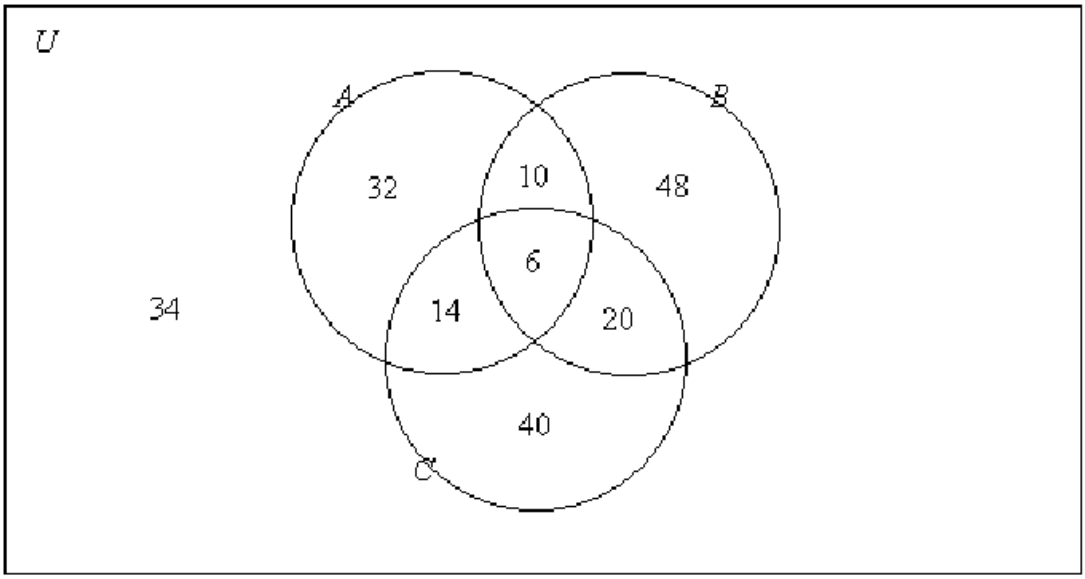
(r) $(B \cap C)' = \{1, 2, 3, 4, 5, 6, 7, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

(s) $A \cap B \cap C = \{8, 9\}$

(t) $n(A \cap B \cap C) = 2$

(u) $(A \cap B \cap C)' = \{1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

2. Consider the sets A, B, and C described by the Venn Diagram, which shows **the number of** elements in each region:



Find each of the following:

(a) $n(A) = 32 + 10 + 6 + 14 = 62$

(b) $n(B) = 48 + 10 + 6 + 20 = 84$

(c) $n(C) = 40 + 14 + 6 + 20 = 80$

(d) $n(U) = 34 + 32 + 10 + 6 + 14 + 48 + 20 + 40 = 204$

(e) $n(A') = 204 - 62 = 142$

(f) $n(B') = 204 - 84 = 120$

(g) $n(C') = 204 - 80 = 124$

(h) $n(A \cup B) = 62 + 48 + 20 = 130$

(i) $n\left((A \cup B)'\right) = 204 - 130 = 74$

(j) $n(A \cup C) = 62 + 40 + 20 = 122$

(k) $n(B \cup C) = 84 + 14 + 40 = 138$

(l) $n(A' \cup B) = 142 + 10 + 6 = 158$

(m) $n(A \cup B') = 10 + 6 + 120 = 136$

(n) $n(A \cup B \cup C) = 204 - 34 = 170$

(o) $n(A' \cup B \cup C) = 204 - 32 = 172$

(p) $n(A \cap B) = 10 + 6 = 16$

(q) $n(A \cap C) = 14 + 6 = 20$

(r) $n(B \cap C) = 6 + 20 = 26$

(s) $n\left((B \cap C)'\right) = 204 - 26 = 178$

(t) $n(B' \cap C) = 14 + 40 = 54$

(u) $n(B \cap C') = 10 + 48 = 58$

(v) $n(A \cap B \cap C) = 6$

(w) $n\left((A \cap B \cap C)'\right) = 204 - 6 = 198$

(x) $n(A' \cap B \cap C) = 48 + 20 + 40 = 108$