

Intro to Set and Set Notation

Name _____

1. Let A, B and C be three sets such that:

Set A = {2, 4, 6, 8, 10, 12}, set B = {3, 6, 9, 12, 15} and set C = {1, 4, 7, 10, 13, 16}.

Find:(i) $A \cup B$ $\{2, 4, 6, 8, 10, 12, 3, 9, 15\}$ (ii) $A \cap B$ $\{6, 12\}$ (iii) $B \cap A$ $\{6, 12\}$ (iv) $B \cup A$ $\{3, 6, 9, 12, 15, 2, 4, 8, 10\}$ (v) $B \cup C$ $\{3, 6, 9, 12, 15, 1, 4, 7, 10, 13, 16\}$ (vi) Is $A \cup B = B \cup A$?

(i) (iv)

Yes they are the same.

(vii) Is $B \cap C = B \cup C$? $\{ \} = \{3, 6, 9, 12, 15, 1, 4, 7, 10, 13, 16\}$

No they do not equal.

(viii) $(A \cup B) \cap (A \cap B)$ (i) \cap (ii) $\{6, 12\}$

2. If A = {1, 3, 7, 9, 10}, B = {2, 5, 7, 8, 9, 10}, C = {0, 1, 3, 10}, D = {2, 4, 6, 8, 10}, E = {negative natural numbers} and F = {0}

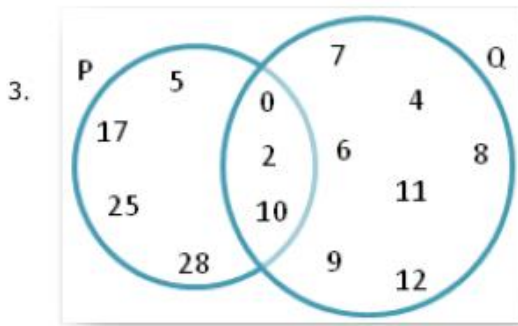
 $E = \{-\mathbb{N}\}$ **Find:**(i) $A \cup B$ $\{1, 3, 7, 9, 10, 2, 5, 7, 8\}$ (ii) $E \cup D$ $\{-\mathbb{N}, 2, 4, 6, 8, 10\}$ (iii) $A \cap B$ $\{7, 9, 10\}$ (iv) $C \cap D$ $\{10\}$ (v) $E \cap D$ $\{ \}$ (vii) $C \cap F$ $\{0\}$ (viii) $B \cap F$ $\{ \}$ (ix) $(A \cup B) \cup (A \cap B)$

(i) (iii)

 $\{1, 3, 7, 9, 10, 2, 5, 7, 8\}$ (x) $(A \cup B) \cap (A \cap B)$

(i) (iii)

 $\{7, 9, 10\}$



(i) P

$$\{5, 0, 17, 2, 25, 10, 28\}$$

(ii) Q

$$\{7, 4, 8, 12, 11, 6, 9, 0, 2, 10\}$$

(iii) $P \cup Q$

$$\{5, 0, 2, 10, 28, 25, 17, 7, 4, 8, 11, 12, 6, 9\}$$

(iv) $P \cap Q$

$$\{0, 2, 10\}$$

(v) $(P)^c$

$$\{7, 4, 8, 6, 11, 9, 12\}$$

(vi) $(Q)^c$

$$\{5, 17, 25, 28\}$$

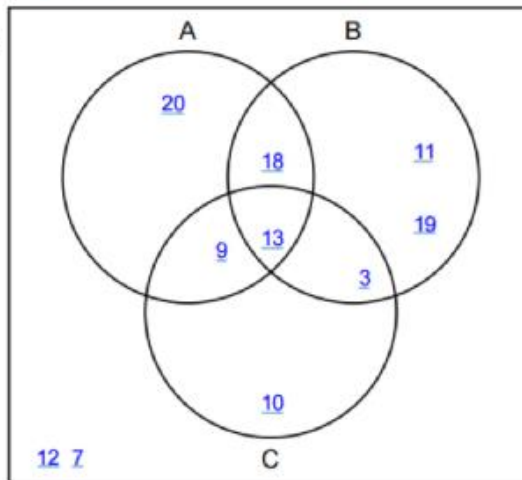
(vii) $\sim(P \cup Q)$

$$\{ \}$$

(viii) $\sim(P \cap Q)$

$$\{5, 17, 25, 28, 7, 6, 9, 4, 11, 12, 8\}$$

4.



a) $(A \cup B)^c \cup C^c =$

$$\{10, 12, 7\} \cup \{20, 18, 11, 19, 12, 7\}$$

$$\{10, 12, 7, 20, 18, 11, 19\}$$

b) $B^c \cup (A \cap C)^c =$

$$\{20, 9, 10, 12, 7\} \cup \{20, 18, 11, 19, 3, 10, 12, 7\}$$

$$\{20, 9, 10, 12, 7, 18, 11, 19, 3\}$$

c) $(A \cup B) \cap C =$

$$\{20, 18, 13, 9, 11, 19, 3\} \cap \{9, 13, 3, 10\}$$

$$\{9, 13, 3\}$$

d) $B \cup (A \cap C) =$

$$\{11, 19, 3, 18, 13\} \cup \{9, 13\}$$

$$\{11, 19, 3, 18, 13, 9\}$$

e) $(A \cup C)^c \cup B =$

$$\{11, 19, 12, 7\} \cup \{11, 19, 18, 13, 3\}$$

$$\{11, 19, 12, 7, 18, 13, 3\}$$

f) $(B \cup C)^c \cup A =$

$$\{20, 12, 7\} \cup \{20, 18, 13, 9\}$$

$$\{20, 12, 7, 18, 13, 9\}$$

g) $C^c \cup (A \cup B) =$

$$\{20, 18, 11, 19, 12, 7\} \cup \{20, 18, 13, 9, 11, 19, 3\}$$

$$\{20, 18, 11, 19, 12, 7, 13, 9, 3\}$$

h) $C \cup (A^c \cap B) =$

$$\{20, 18, 11, 19, 12, 7\} \cup \{20, 18, 13, 9, 10, 12, 7\}$$

$$\{20, 18, 11, 19, 12, 7, 13, 9, 10\}$$