

3.8 Unions & Intersections of Sets

- "OR" compound inequality

* union - two or more sets that contain all elements of the set

- the set of all members that are in A or in B (or in both)

- " $A \cup B$ ", A union B



* Review problem 1 on pg. 215

* Got it #1) $P = \{0, 1, 2, 3, 4\}$
A) $Q = \{2, 4\}$

$$P \cup Q = \{0, 1, 2, 3, 4\}$$

or

$$P \cup Q = \{P\}$$

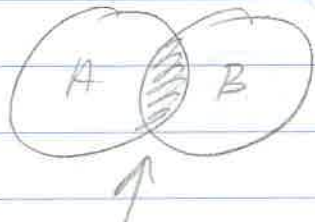
B) Set P is the universe
&

$$Q \subseteq P$$

* intersections - "AND" compound inequality

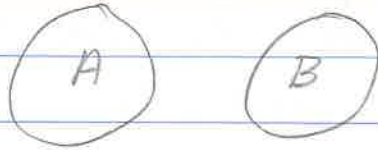
- set of elements that are common to every set/both set

- A intersection B, " $A \cap B$ "



↑
intersection
 $A \cap B$

* Disjoint sets - have no elements in common



* Review Problem 2 on pg. 216
 * Got it? #2)

- a) $A \cap B = \{2, 8\}$
- b) $A \cap C = \{ \}$ or \emptyset
- c) $C \cap B = \{5, 7\}$

② Set Y & Z are disjoint sets & the solution to $Y \cap Z$ is \emptyset

* Review Problem 3 on pg. 216
 Got it? #3)

$$A = \{A, B, C, D, E\}$$

$$B = \{A, E, I, O, U\}$$

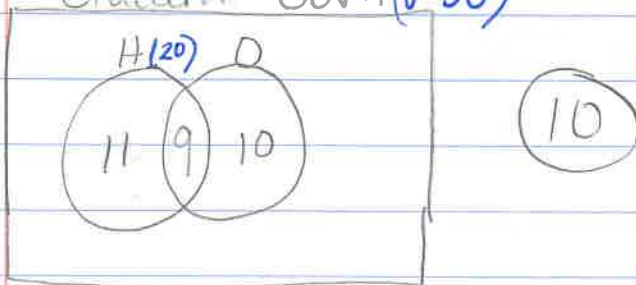
$$C = \{V, E, G, E, T, A, B, L, E\}$$

OR use a Venn Diagram

Answer: $\{A, E\}$

* Review Problem 4 on pg. 217
 * Got it #4)

Student Govt. ($N=30$)



* Review Problem 5 on pg. 218

* Got it? #5

$$A) 8 \leq x+5 < 11$$

* AND compound

inequality is
the intersection or
overlapping of
both solution sets

$$\begin{array}{r} 8 \leq x+5 \quad x+5 < 11 \\ -5 \quad -5 \quad -5 \quad -5 \\ 3 \leq x \quad \quad x < 6 \end{array}$$

$$\{x \mid x \geq 3\} \cap \{x \mid x < 6\}$$

$$B) |4x-6| > 14$$



$$4x-6 > 14$$
$$+6 \quad +6$$

$$\frac{4x > 20}{4}$$

$$x > 5$$

$$4x-6 < -14$$

$$+6 \quad +6$$

$$\frac{4x < -8}{4}$$

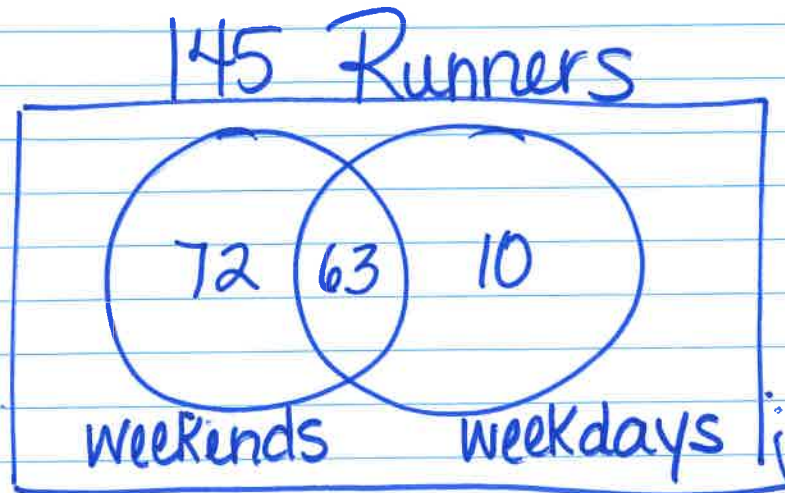
$$x < -2$$

* OR compound
inequality or
the union
of both
solution sets

$$\{x \mid x < -2\} \cup \{x \mid x > 5\}$$

pg. 227
24

Add Venn
Diagram
Problem
Prior to Test



10 run only during
the week

3.8 pg. 218 #10-42 even

(10) $A \cup B = \{0, 1, 2, 3, 4, 6, 8\}$

(12) $A \cup D = \{1, 3, 4, 5, 7, 9\}$

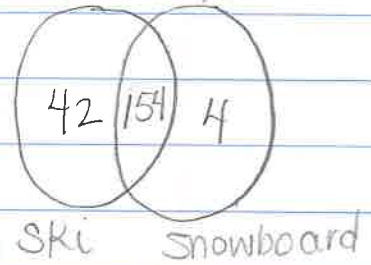
(14) $B \cup D = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

(16) $A \cap B = \{4\}$

(18) $A \cap D = \{1, 3\}$

(20) $B \cap D = \emptyset$

(26) survey = 200



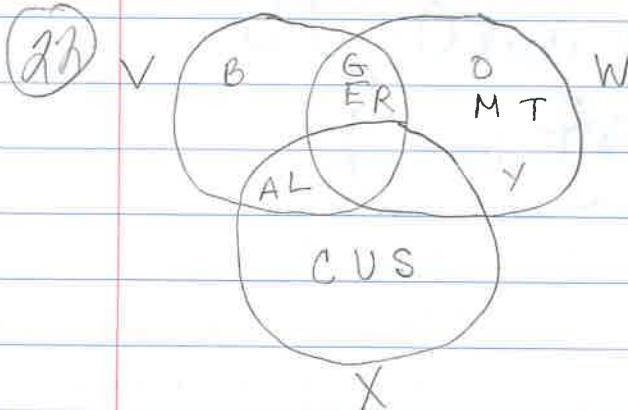
Ski Snowboard

(158)

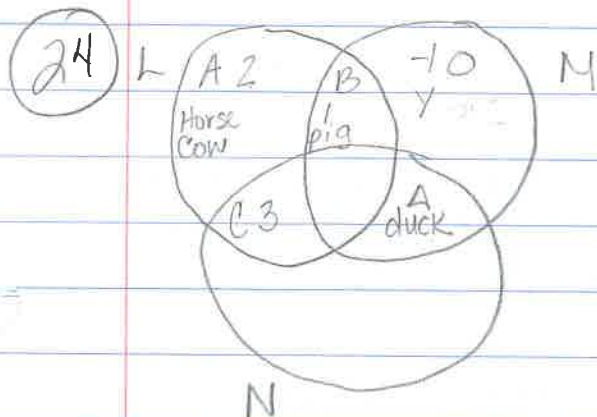
(28) $-6 < n + 7 \leq 21$

$$\begin{array}{r} -6 < n + 7 & n + 7 \leq 21 \\ -7 & -7 & -7 & -7 \\ -13 < n & n \leq 14 \\ n > -13 & \text{and} \end{array}$$

$\{n | n > -13\} \cap \{n | n \leq 14\}$



(30) $3 \leq |5d + 11|$



$$\begin{array}{r} 3 \leq 5d + 11 & -3 \geq 5d + 11 \\ -11 & -11 & -11 & -11 \\ -8 \leq 5d & -14 \geq 5d \\ \hline 5 & 5 \end{array}$$

$d \geq -\frac{8}{5}$ or $d \leq -\frac{14}{5}$
 $\{d | d \leq -\frac{14}{5}\} \cup \{d | d \geq -\frac{8}{5}\}$

$$(32) |4.5t - 1.5| \leq 12$$

$$4.5t - 1.5 \leq 12$$

$$+1.5 \quad +1.5$$

$$4.5t \leq 13.5$$

$$4.5$$

$$t \leq 3$$

$$4.5t - 1.5 \geq -12$$

$$+1.5 \quad +1.5$$

$$4.5t \geq -10.5$$

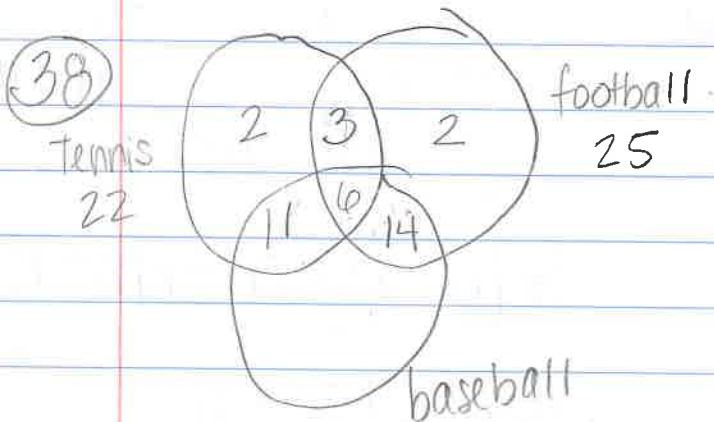
$$t \geq -2\frac{1}{3}$$

AND

$$\{t | t \geq -2\frac{1}{3}\} \cap \{t | t \leq 3\}$$

$$(34) X \cap Y \cap Z = \{\} \emptyset$$

$$(36) M \cap N = \{x | x \text{ is a multiple of } 15\}$$



only tennis & football = 3
 only tennis & baseball = 11
 only baseball & football = 14

H = none

$$(40) A \times B = \{(1, -3), (1, -2), (1, -1), (1, 0), (2, -3), (2, -2), (2, -1), (2, 0), (3, -3), (3, -2), (3, -1), (3, 0)\}$$

$$(42) A \times B = \{(grape, jam), (grape, juice), (apple, jam), (apple, juice), (orange, jam), (orange, juice)\}$$