

Math 3201

Unit 1 Review

NAME: Answer Key

Part 1: Multiple Choice: Circle the correct answer for each question.

1) If $C = \{\text{Alicia, Michelle, Shannon, Cole, Jarod, Jordan}\}$, what is $n(C)$?

- (A) 3 (B) 4 (C) 5 (D) 6

2) $U = \{\text{ice hockey, basketball, golf, tennis, volleyball, soccer}\}$. If $B = \{\text{sports that use a ball}\}$, which element would be in B^c ?

- (A) Basketball (B) Golf (C) Ice Hockey (D) Soccer

3) Which of the following groups represents disjoint sets?

(A) Group 1: people who regularly drink milk
Group 2: people who regularly drink Pepsi

(B) Group 1: people who have an Ipod
Group 2: people who have a cellular phone line

(C) Group 1: the set of all odd numbers
Group 2: the set of all even numbers

(D) Group 1: the set of all multiples of 4
Group 2: the set of all factors of 24

4) Which of the following phrases describes an empty set?

(A) Common factors of 4 and 12

(B) Prime numbers that are even

(C) Multiples of 5 that are less than 10

(D) Factors of 10 that are divisible by 4

Factors of 10 $\rightarrow \{2, 5, 10\}$ ~~None~~ none divisible by 4

5) Set M consists of the multiples of 4 from 1 to 50. Which represents set notation?

$\{4, 8, 12, 16, 20, \dots, 48\}$

(A) $M = \{1, 2, 3, \dots, 48, 49, 50\}$

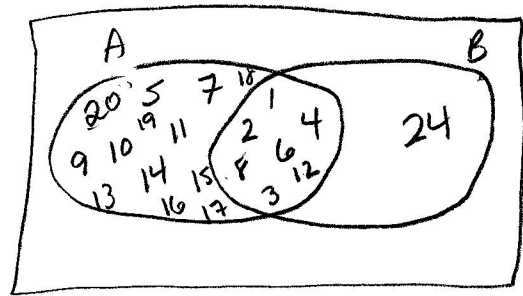
(B) $M = \{m = 4, 1 \leq x \leq 50, x \in N\}$

(C) $M = \{m = 4x | 1 \leq x \leq 50, x \in N\}$

(D) $M = \{m = 4x | 1 \leq x \leq 12, x \in N\}$

$$M = 4x \mid 1 \leq x \leq 12$$

multiples of 4: $4x \rightarrow 4(1) = 4$ 1st multiple
 $4(12) = 48$ Last multiple
 $\therefore 1 \leq x \leq 12$



Use the following information to answer #6 and #7

$A = \{\text{natural numbers from 1 to 20}\}$
 $B = \{\text{factors of 24}\}$

- 6) Which represents $(A \cup B)$?
 (A) $\{2, 4\}$
 (B) $\{1, 2, 3, 4, 6, 8, 12\}$
 (C) $\{1, 2, 3, 4, 6, 8, 12, 24\}$
 (D) $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24\}$

$A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$
 $B = \{1, 2, 3, 4, 6, 8, 12, 24\}$

- 7) Which represents $(A \cap B)$? \rightarrow overlap
 (A) $\{2, 4\}$
 (B) $\{1, 2, 3, 4, 6, 8, 12\}$
 (C) $\{1, 2, 3, 4, 6, 8, 12, 24\}$
 (D) $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

$1, 2, 3, 4, 6, 8, 12$

- 8) Consider the following sets:
 $R = \{0, 1, 2, 3, 4, 5, 6\}$
 $S = \{2, 4, 6, 8\}$
 $T = \{1, 2, 3, 6\}$

$T \subset R$

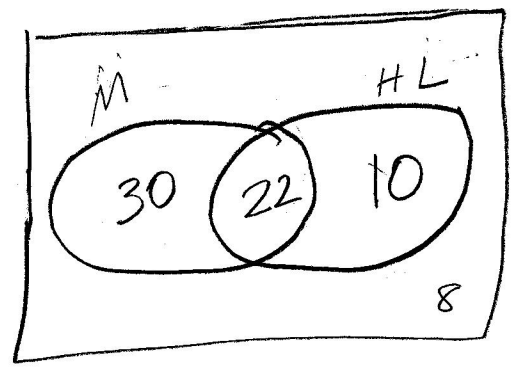
Which of the following statements is true?

- (A) $R \subset S$ (B) $R \subset T$ (C) $S \subset R$ (D) $T \subset R$

Use the following information to answer #9 and #10

Students in a particular high school were surveyed to determine the subjects in which they were currently enrolled. The table below represents the data that was collected.

Courses	Number of students
Math <u>only</u>	30
Healthy Living <u>Only</u>	10
Math and Healthy Living	22
Neither Course	8



- 9) How many students are in the universal set?
 (A) 32
 (B) 52
 (C) 62
 (D) 70

$30 + 22 + 10 + 8 = 70$

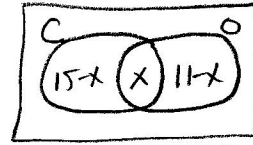
10) How many students are taking Math or Healthy Living? [Hint: "or" means union]

- (A) 22
- (B) 40
- (C) 62
- (D) 70

$$30 + 22 + 10 = 62$$

11) There are 20 students in Mr. Walsh's Grade 1 class
 15 students like chocolate chip cookies
 11 students like oatmeal raisin cookies
 All students like at least one type of cookie.
 How many students like BOTH types of cookies?

Method 2



$$15 - x + x + 11 - x = 20$$

$$26 - x = 20$$

$$26 - 20 = x$$

$$6 = x$$

- (A) 3
- (B) 5
- (C) 6
- (D) 9

Method 1

$$15 + 11 = 26$$

$$26 - 20 = 6 \text{ in overlap}$$

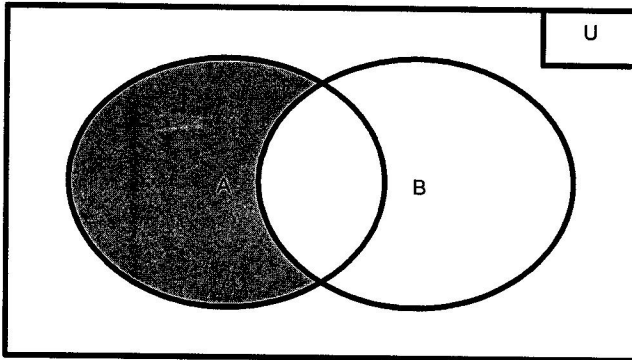
12) Vehicles with a sunroof are represented by S and vehicles with a hands-free phone system are represented by P

Which of the following illustrated S intersect P ($S \cap P$)?

overlap between sunroof + hands free

- (A) A vehicle having a sunroof or a hands free system \times
- (B) A vehicle having a sunroof and a hands-free phone system \checkmark
- (C) A vehicle having a sunroof but no hands free phone system \times
- (D) A vehicle with no sunroof but does have a hands-free system \times

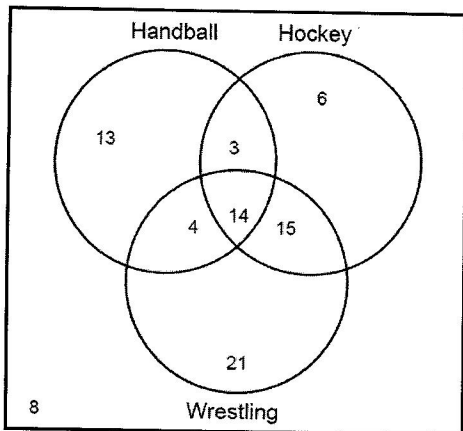
13) Which represents the shaded region in the Venn Diagram shown?



$A \setminus B$ A minus B
 Everything in A, but not in B

- (A) $A \cup B$
- (B) $A \cap B$
- (C) $A \setminus B$
- (D) $B \setminus A$

14) What does the '3' represent in this Venn Diagram shown?



Handball and hockey, but not wrestling

- (A) The number of people who like handball and hockey, but not wrestling.
- (B)** The number of people who like handball and hockey but not wrestling.
- (C) The number of people who like hockey and wrestling.
- (D) The number of people who like hockey and wrestling but not handball.

Part 2: Constructed Response: Answer all questions in the space provided. Be sure to show all workings.

15) A survey was conducted to determine where people buy coffee.

82 people buy coffee at Tim Hortons.

65 people buy coffee at StarBucks.

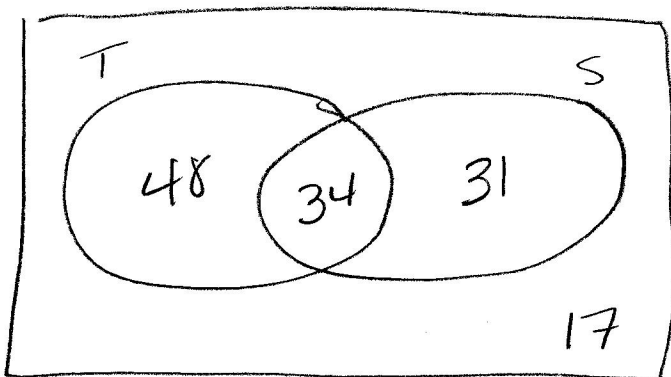
17 people did not buy coffee at all.

If 130 people were surveyed, how many people buy coffee from ONLY Starbucks?

[Hint: Make a Venn Diagram]

$$82 + 65 + 17 = 164$$

$$164 - 130 = 34 \text{ overlap}$$



$$\frac{\text{Only Starbucks}}{31}$$

16) In a school of 120 students

5 students took English, Physics, and Chemistry

15 students took Physics and English

8 students took Physics and Chemistry

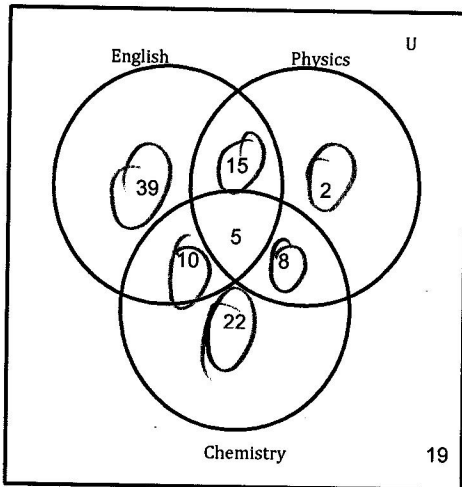
10 students took English and Chemistry

99 students took English **or** Chemistry [Hint: "or" means the same as union]

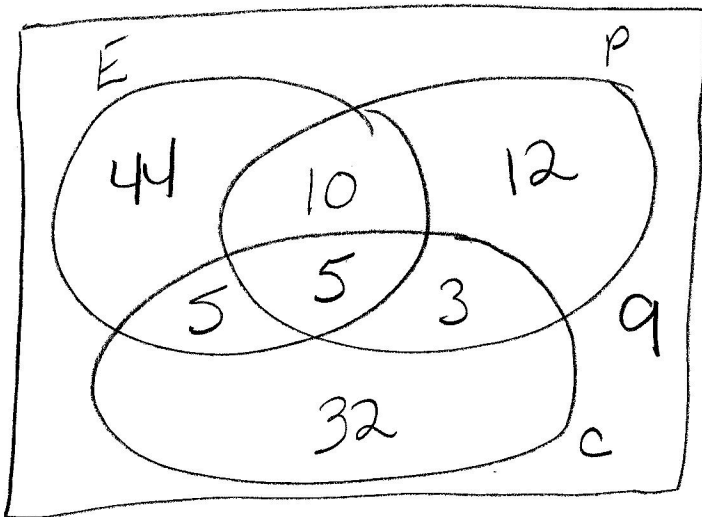
45 took Chemistry

30 students took Physics

James summarized the data using the Venn Diagram shown below:

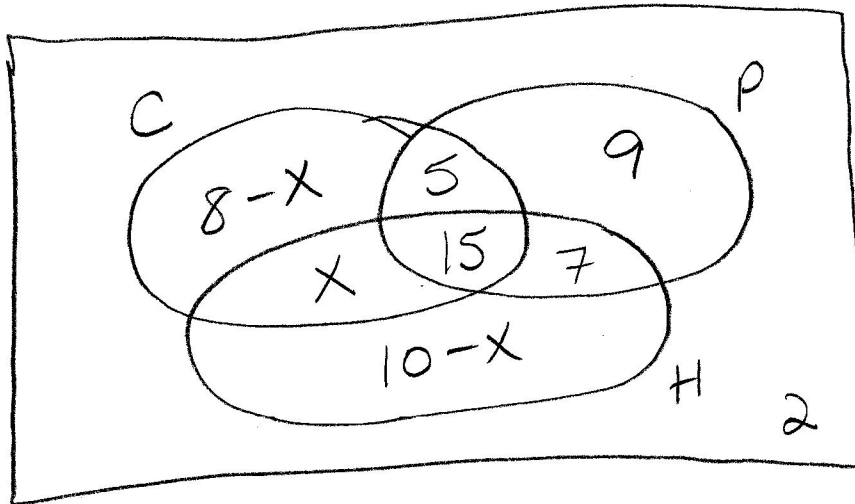


Identify the regions in James' Venn diagram that have errors and describe the errors that James made. Provide a correct Venn diagram with the correct entries.



Total in the sets = 111
 $120 - 111 = 9$ outside the sets

- 17) In a survey of 50 children the following results were recorded.
 28 people liked chicken burgers
 36 people liked pizza
 32 people liked hot dogs
 2 people did not like either of these choices.
 7 people liked pizza and hot dogs but not chicken burgers.
 5 people liked chicken burgers and pizza but not hot dogs.
 15 people liked all three foods.
 How many children liked chicken burgers and hot dogs but not pizza?



$$8-x + 5 + 9 + x + 15 + 7 + 10-x + 2 = 50$$

$$56 - x = 50$$

$$56 - 50 = x$$

$$6 = x$$

Chicken Burgers and hot dogs, but not pizza

6