

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 6 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	6	
2	12	
3	12	
4	4	
5	4	
6	3	
7	3	
8	4	
9	9	
10	9	
11	16	
12	4	
13	14	
Total	100	

Name \_\_\_\_\_

Circle Final Answers

1) (3 points each) Label the following as either inductive or deductive reasoning and explain why:

a) I get paid every other Friday. I was paid last Friday. I will not be paid this Friday.

b) The last two Fridays I was paid. Therefore, I will be paid this Friday.

2) (3 points each) In the following number patterns, write the most likely next number/equation:

a)  $-10, -6, -2, 2, 6, 10, \underline{\hspace{2cm}}$

b)  $8, 4, 2, 1, \underline{\hspace{2cm}}$

c)  $2, 7, 15, 26, 40, \underline{\hspace{2cm}}$

d)  $1^2 + 2 = 2^2 - 1$

$$2^2 + 3 = 3^2 - 2$$

$$3^2 + 4 = 4^2 - 3$$

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3) (4 points each) Find the following sums:

a)  $1+3+5+7+\dots+997$

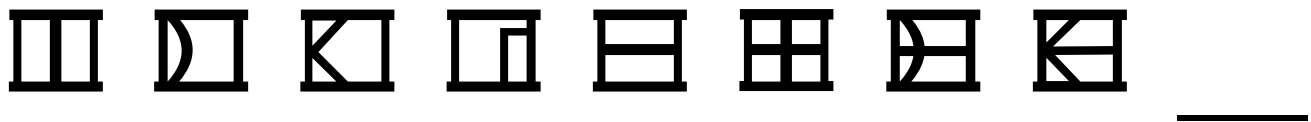
b)  $1+2+3+4+\dots+5,000$

c)  $500+501+502+\dots+5,000$

4) (4 points) Find the sum  $a+b+c+d$  where:

$$\begin{array}{r}
 5 \quad c \quad 8 \quad 3 \\
 - \quad d \quad 5 \quad 2 \quad a \\
 \hline
 2 \quad 6 \quad b \quad 6
 \end{array}$$

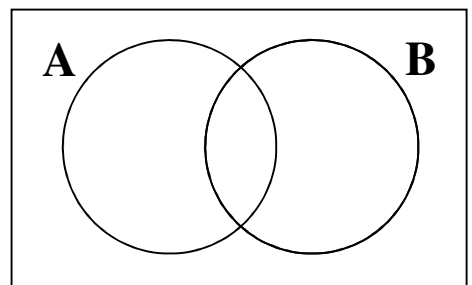
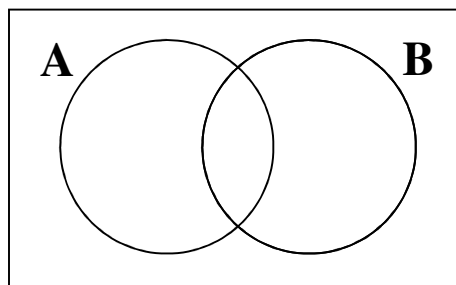
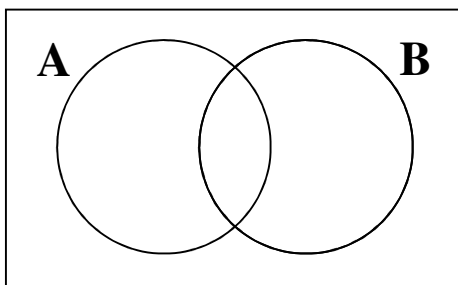
5) (4 points) Draw the next symbol in the sequence:



6) (3 points) Write in set-builder notation: {France, Germany, Italy, Spain,...}:

7) (3 points) Write in roster notation:  $\{x \mid x \text{ is an animal}\}$

8) (4 points) Shade in the Venn Diagram representation for  $A \cup B'$ . Be sure to mark which one is the final answer:



For numbers 9 – 11, use the following:

$$U = \{a, b, c, d, e, f, g, h, i, j\}, A = \{a, b, c\} \quad B = \{x \mid x \text{ is a vowel}\}$$

9) (3 points each) Use the symbol  $\in$  or  $\notin$  below:

a)  $a$  \_\_\_\_\_  $A$

b)  $d$  \_\_\_\_\_  $A'$

c)  $u$  \_\_\_\_\_  $B$

10) (3 points each) Use the symbol  $\subseteq$  or  $\not\subseteq$  below:

a)  $\{a, e\}$  \_\_\_\_\_  $B$

b)  $\{d, e\}$  \_\_\_\_\_  $B'$

c)  $\emptyset$  \_\_\_\_\_  $A$

11) (4 points each) List the elements of the following sets:

a)  $A \cap B$ :

b)  $A' \cup B'$ :

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

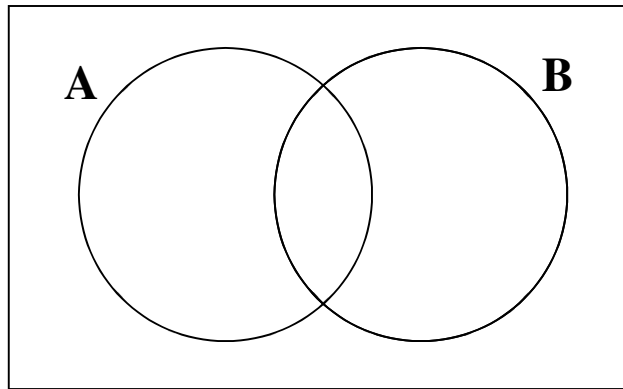
d) The subsets of set  $A$ :

12) (4 points) Fill in the Venn Diagram with the appropriate numbers:

$$U = \{1, 2, 3, \dots, 10\}$$

$$A = \{x \mid x \text{ is prime}\}$$

$$B = \{2, 5, 9, 10\}$$

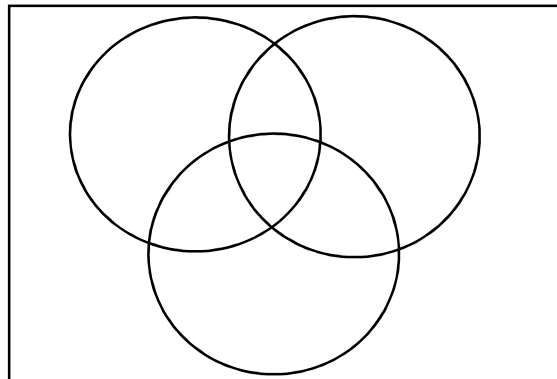


13) 100 people were surveyed on what addition(s) they like on their burgers. The results are below:

- 46 people like Bacon
- 40 like Lettuce
- 30 like Tomato
- 16 like Bacon and Lettuce
- 15 like Bacon and Tomato
- 8 like Lettuce and Tomato
- 6 like all three

Given this information, find...

a) (5 points) The corresponding Venn Diagram. Be sure to label **EVERYTHING AND SHOW THE NUMBERS YOU ARE ADDING TO GET YOUR ANSWER:**



b) (3 points) How many people like either Lettuce or Tomato but not Bacon?

c) (3 points) How many people only like Bacon?

d) (3 points) How many people do not like Lettuce nor Tomato?

# Sum Formulas

## Odds

$$1 + 3 + 5 + 7 + \dots + (2n - 1) = n^2$$

## Evens and Odds

$$1 + 2 + 3 + 4 + \dots + n = \frac{n(n+1)}{2}$$