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 5 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. A pencil must be used on all tests. Otherwise, the test will not be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	3	
2	16	
3	15	
4	3	
5	3	
6	3	
7	3	
8	9	
9	6	
10	16	
11	5	
12	18	
Total	100	

Name _____

Circle Final Answers

1) (3 points) Determine if the following argument is inductive or deductive reasoning and explain why:

Every time that it storms the electricity goes off.
Today, it is storming. Therefore, the electricity will go off.

2) (4 points each) Determine the next most probable number or statement in the list:
a) 2, 8, 14, 20, _____ b) 2, -6, 18, -54, _____

c) –3, –1, 8, 24, 47, _____ d) $1+3+5=3^2$

$1+3+5+7=4^2$

$1+3+5+7+9=5^2$

_____

3) (4 points each) Find the following sums:
a) $1+3+5+7+...+97$ b) $1+2+3+4+...+101$

b) $71+72+73+74+...+101$

4) (3 points) Find the values of a, b, c, and d. Be sure to label your answers:

$$\begin{array}{r}
a\ \ 7\ \ 1\ \ 5 \\
-\ \ 2\ \ 8\ \ c\ \ d \\
\hline
4\ \ b\ \ 2\ \ 4
\end{array}$$

5) (3 points) For the following matchstick problem, describe how to move 3 of the matchsticks to make 3 equal-sized squares without having any unused matchsticks. You may use letters to label the matchsticks and arrows to supplement your response.

6) (3 points) Write in set-builder notation: $\{$Ohio, Flordia, Washington, Maine...$\}$

7) (3 points) Write in roster-notation: $\{x \mid x$ is a color$\}$

Problems 8 – 10 use the following:

Let $U = \{5,6,7,8,9,10,11,12\}$ and let $A = \{x \mid x$ is prime$\}$ and $B = \{x \mid x$ has two digits$\}$

8) (3 points each) Use $\in$ or $\notin$ below:

a) 12 _____ B 　　　　　　b) 11 _____ $A \cap B$ 　　　　　　c) 3 _____ A

9) (3 points each) Use $\subseteq$ or $\not\subseteq$ below:

a) $\{7, 9\}$ _____ A 　　　　　　b) $\{5,7\}$ _____ B'

10) (4 points each) Find the following sets…

a) $A \cup B$ 　　　　　　b) $\left(A \cup B\right)'$

c) $A - B$ 　　　　　　d) Subsets of B

11) (5 points) 100 adults who watch British television were surveyed. The results are given in the Venn diagram below where S = Adults who watch *Sherlock* and D = Adults who watch *Downton Abbey*. Interpret, in English, what each number in the Venn diagram means for this example:

S 23 56 17 D 4
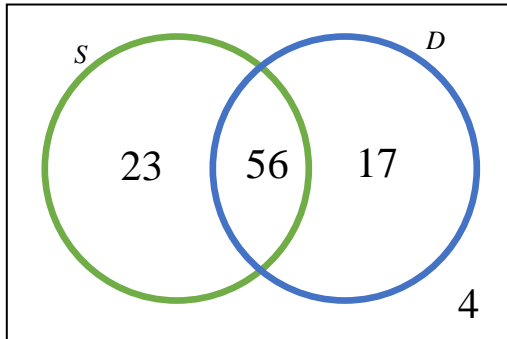
12) (6 points part *a*; 4 points else) A recent survey was conducted where 100 people were asked which of the following movies they saw:

> 33 saw *Arrival*
> 39 saw *The Lego Batman Movie*
> 40 saw *Fantastic Beasts*
> 13 saw *Arrival* and *The Lego Batman Movie*
> 18 saw *Arrival* and *Fantastic Beasts*
> 16 saw *The Lego Batman Movie* and *Fantastic Beasts*
> 10 saw all three

Use the given this information to answer the following questions. **Be sure to write the numbers you are using for the sums**:

a) Draw and label a Venn diagram:
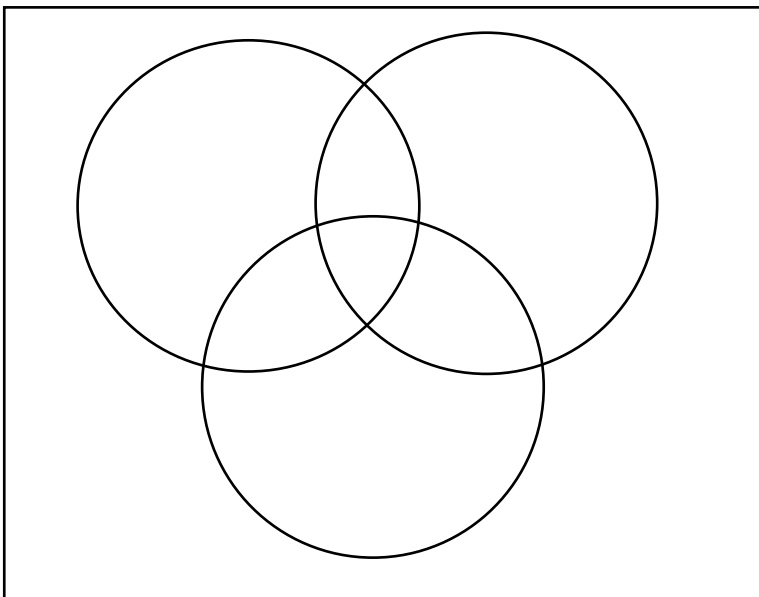
b) How many people saw *The Lego Batman Movie* or *Arrival* but not *Fantastic Beasts*?

c) How many people do not see *Arrival*?

d) How many people saw at least two movies?

4

Sum Formulas

Odds

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

Evens and Odds

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