

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.

rule → deductive
 because we are given a rule.

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

observation → inductive because the conclusion was based on an observation.

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

a) -10, -6, -2, 2, 6, 10, 14
 ↗ ↘ ↗ ↘ ↗ ↘ ↗
 +4 +4 +4 +4 +4 +4

b) 81, 27, 9, 3, 1
 ÷3 ÷3 ÷3

c) 2, 7, 15, 26, 40, 57
 ✓ ✓ ✓ ✓ ✓
 5 8 11 14 17
 ✓ ✓ ✓ ✓ ✓
 3 3 3 3

d) $1^2 + 2 = 2^2 - 1$
 $2^2 + 3 = 3^2 - 2$
 $3^2 + 4 = 4^2 - 3$
 $4^2 + 5 = 5^2 - 4$

3) (3 points parts a and b; 4 points part c) Find the following sums:

a) $1 + 3 + 5 + 7 + \dots + 1,111$
 $2n - 1 = 1111$
 $2n = 1112$
 $n = 556$
 $= 556^2$
 $= 309,136$

b) $1 + 2 + 3 + 4 + \dots + 412$
 $n = 412$
 $= \frac{412(412+1)}{2} = 85,078$

c) $123 + 124 + 125 + \dots + 412$
 missing → $1 + 2 + 3 + \dots + 122 = \frac{122(122+1)}{2} = 7503$

$85078 - 7503 = 77,575$

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

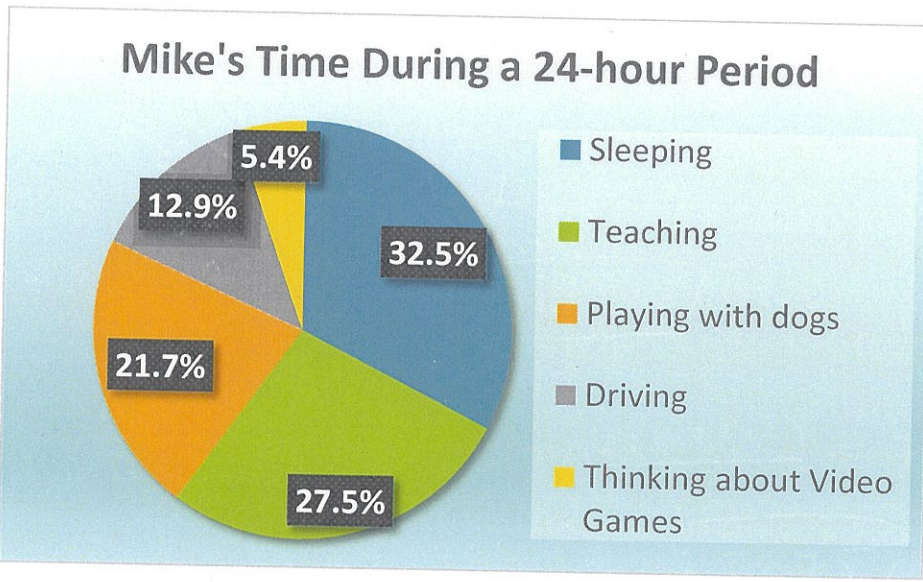
$$\begin{array}{r}
 8^4 \quad c \quad 8^7 \quad 13 \\
 - \quad d \quad 5 \quad 2 \quad a \\
 \hline
 2 \quad 6 \quad b \quad 6
 \end{array}$$

$$\left. \begin{array}{l} a=7 \\ b=5 \\ c=1 \\ d=2 \end{array} \right\} \text{sum} = \boxed{15}$$

5) (4 points) Where should the X's move next to guarantee victory?

		X <i>← i aqui!</i>
O		X <i>← qua!</i>
X	O	

6) (3 points each) Using the chart below, answer the following questions. Round answers to one decimal place:



a) How many hours does Mike sleep during the 24-hour period?

$$32.5\% \text{ of } 24 = \boxed{7.8 \text{ hrs}}$$

b) How many more hours does Mike play with this dogs than he does think about video games during the 24-hour period?

$$21.7\% - 5.4\% = 16.3\% \\
 16.3\% \text{ of } 24 = \boxed{3.912 \text{ hrs}}$$

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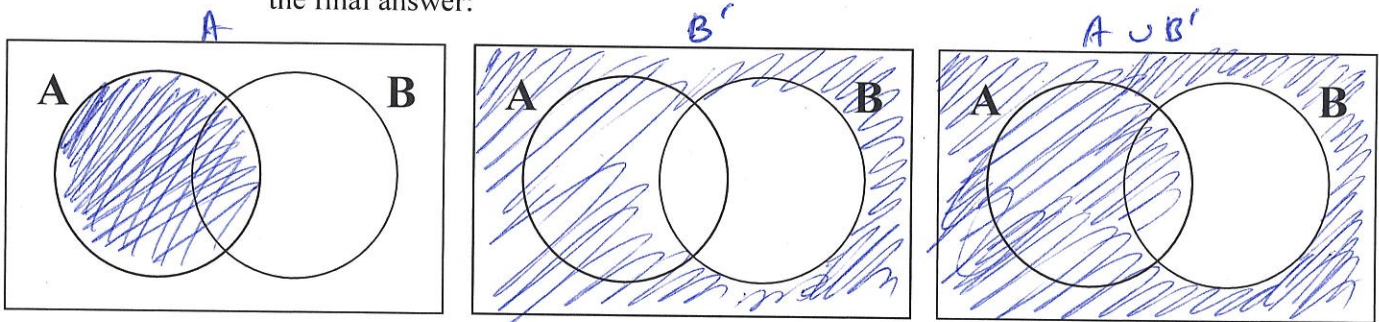
7) (2 points) Write in set-builder notation: {France, Germany, Italy, Spain,...}:

$$\{x \mid x \text{ is a European country}\}$$

8) (2 points) Write in roster notation: {x | x is an animal}

$$\{\text{dog, cats, platypus, ...}\}$$

9) (4 points) Shade in the Venn Diagram representation for $A \cup B'$. Be sure to mark which one is the final answer:



For numbers 10 – 12, use the following:

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

10) (3 points each) Use the symbol \in or \notin below:

a) $a \in A$

b) $d \in A'$

c) $u \notin B$

11) (3 points each) Use the symbol \subseteq or $\not\subseteq$ below:

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

b) $\{d, e\} \not\subseteq B'$

c) $\emptyset \subseteq A$

12) (4 points each) List the elements of the following sets:

a) $A \cap B$:

$$\{a\}$$

b) $A' \cup B'$:

$$\{d, e, f, g, h, i, j\}$$

$$= \{b, c, d, e, f, g, h, i, j\}$$

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

complement

$$= \{b, c, d, e, f, g, h, i, j\}$$

d) The subsets of set A:

$$\{a, b, c\}$$

$$\{a, b\}$$

$$\{a\}$$

$$\emptyset$$

$$\{a, c\}$$

$$\{c\}$$

$$\{b, c\}$$

$$\{c\}$$

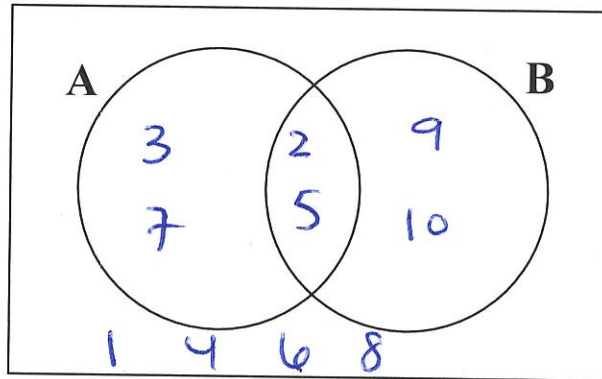
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13) (4 points) Fill in the Venn Diagram with the appropriate numbers in the correct locations:

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

$$A = \{x \mid x \text{ is prime}\} \rightarrow \{2, 3, 5, 7\}$$

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



14) 100 people were surveyed on what addition(s) they pretend to like on Valentine's Day. The results are below:

candy

46 people like Conversation Hearts

40 like Dark Chocolate

30 like Stuffed Toys

16 like Conversation Hearts and Dark Chocolate

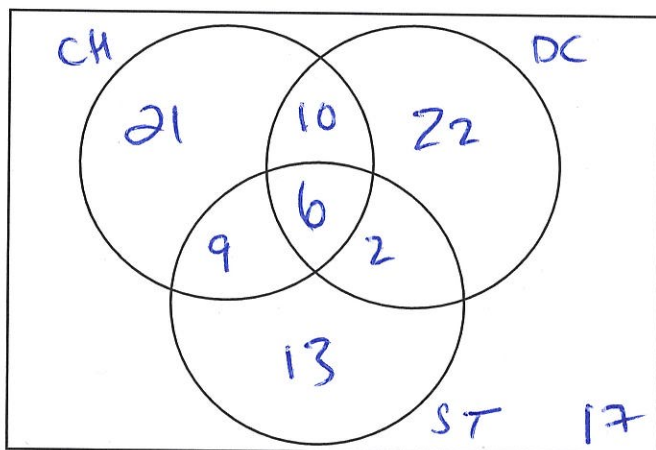
15 like Conversation Hearts and Stuffed Toys

8 like Dark Chocolate and Stuffed Toys

6 like all three

Given this information, find...

a) (6 points) The corresponding Venn Diagram. Be sure to label **EVERYTHING** AND SHOW THE NUMBERS YOU ARE ADDING TO GET YOUR ANSWER:



b) (2 points) How many people like either Dark Chocolate or Stuffed Toys but not Conversation Hearts?

$$22 + 2 + 13 = \boxed{37}$$

c) (2 points) How many people only like Conversation Hearts?

$$\boxed{21}$$

d) (2 points) How many people do not like Dark Chocolate nor Stuffed Toys?

$$21 + 17 = \boxed{38}$$

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