

MLCS 0099
University of North Georgia
Summer 2015
Exam #1

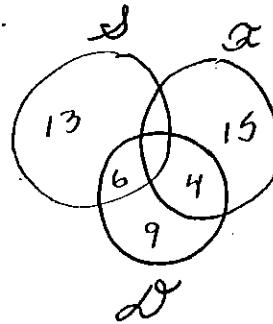
Name: Key Date: June 23, 2015

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Draw a picture to illustrate the situation.

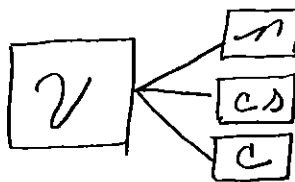
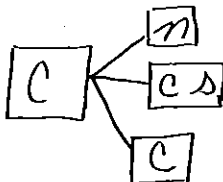
- 1) A school has a Spanish Club, a French Club, and a Drama Club, which have 19 members each. The Spanish and Drama Club have 6 members in common. The Drama and French Club have 4 members in common. The Spanish and French club have no members in common.

Spanish = S
French = F
Drama = D



List the items mentioned. Try to organize your list in a systematic way.

- 2) A frozen yogurt stand has chocolate and vanilla yogurt. For toppings it has nuts, coconut syrup, or candy pieces. List all combinations that use one flavor and one topping.



(C, n), (C, cs), (C, c)

(V, n), (V, cs), (V, c)

Continue the pattern for five more items in the list.

3) 5, 8, 11, 14, ... 17, 20, 23, 26, 29
+3 +3 +3 ...

Solve the problem by guessing and adjusting.

- 4) Corinne is making a beaded necklace. She has 3 times as many green beads as red beads, and twice as many blue beads as green beads. If she has 90 beads all together, how many of the beads are blue?

$$\begin{aligned} \text{red} &= x = 9 & x + 3x + 2(3x) &= 90 \\ \text{green} &= 3x = 27 & 4x + 6x &= 90 \\ \text{blue} &= 2(3x) = \boxed{54} & 10x &= 90 \\ & & x &= 9 \end{aligned}$$

$9 + 27 + 54 = 90 \checkmark$

Determine whether the statement is true or false. If it is true, give two examples to illustrate it. If it is false, give a single counterexample. SHOW HOW YOU ARRIVE AT YOUR RESULT!

5) If Jackson got a higher grade than Ethan, and Steve got a lower grade than Ethan, then Steve got a lower grade than Jackson.

<p>① True Let $x = 10$</p> <p>① Let Ethan = $x = 10$</p> <p>② Jackson = $x + 1 = 11$</p> <p>③ Steve = $x - 1 = 9$</p>	<p>Let $x = 50$</p> <p>50</p> <p>51</p> <p>49</p>
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Explain the difference between the symbols and give an example.

6) \subseteq and \subset

\subseteq is a sub-set. If $A \subseteq B$, then all members in A are also in B .

\subset is a proper sub-set. $A \subseteq B$ and $A \neq B$.

Round the number to the place value indicated.

7) 15,889,386

16,000,000

$A = \{1, 3, 5\}$ & $B = \{1, 2, 3, 4, 5\}$

Estimate the answer by rounding as indicated.

8) Estimate by rounding to the nearest ten. Note, show your thought process in rounding, not the exact result.

39	
x 55	
40	
60	
2400	

Estimate the answer. State whether the estimate is larger or smaller than the exact answer.

9) Each gallon of porch and deck paint covers 200 square feet. How many gallons are needed to cover 753 square feet? Again as in the prior question, you only need to show your estimation process.

$800 \div 200 = 4 \text{ ga.}$

Larger

Estimate the answer using compatible numbers.

10) $3.8\% \times 590$

$.04 \times 600 = 24$

Use set notation to list all the elements of the set.

- 11) The letters needed to spell these words:
tear, rate, rat, tea

$$\{t, e, a, r\}$$

- 12) $\{x : x \text{ is an even natural number less than } 10\}$

$$\{2, 4, 6, 8\}$$

- 13) The whole numbers between -3 and 0, not inclusive

$$\{\emptyset\} = \text{Null Set} = \emptyset$$

Determine whether the set is well defined or not.

- 14) $\{x : x \text{ is spy books in the library}\}$

Not Well Defined

Replace the # with either \in or \notin to express a true statement.

- 15) Georgia # $\{r : r \text{ is a state in the United States}\}$

\in - element of

Find $n(A)$ for the set.

- 16) $A = \{-6, -5, -4, \dots, 0\}$

$$n(A) = 7$$

Decide whether the statement is true or false.

17) $\{6, 22, 30, 58\} \subseteq \{2, 4, 6, 8, \dots, 98\}$

True

18) $\emptyset \subseteq \{5, 10, 15, 20, 25\}$

True

List the subsets.

19) List all of the two element subsets of the set $\{a, b, c, d, e\}$.

$(a, b), (a, c), (a, d), (a, e), (b, c), (b, d)$
 $(b, e), (c, d), (c, e), (d, e)$

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

Let A and B be sets with cardinal numbers, $n(A) = a$ and $n(B) = b$, respectively. Decide whether the statement is true or false.

20) $n(A \cup B) + n(A \cap B) = n(A) + n(B)$

$5 + 1 = 3 + 3$

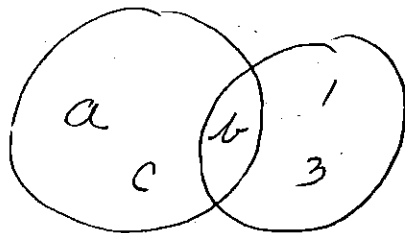
e.g. $6 = 6$

True

$A = \{a, b, c\}$ $B = \{1, b, 3\}$

$n(A) = 3$

$n(B) = 3$



$n(\{a, b, c\} \cup \{1, b, 3\}) =$

$\{a, b, c, 1, 3\} = 5$

$n(\{a, b, c\} \cap \{1, b, 3\}) = 1$

Answer Key

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- 1) Answers will vary. Possible answer is 3 circles linked like a chain.
- 2) (chocolate, nuts), (chocolate, coconut syrup), (chocolate, candy), (vanilla, nuts), (vanilla, coconut syrup), (vanilla, candy)
- 3) 17, 20, 23, 26, 29
- 4) 54
- 5) True. Possible illustration. Suppose Jackson scored 90, Ethan scored 80, and Steve scored 70. Then Steve's score is lower than Jackson's score.
- 6) Answers will vary. One possibility: the first symbol has a line beneath it, and the second does not.
- 7) 16,000,000
- 8) 2400
- 9) 4; larger
- 10) 24
- 11) {a,e,r,t}
- 12) {2, 4, 6, 8}
- 13) \emptyset
- 14) Not well defined
- 15) \in
- 16) $n(A) = 7$
- 17) True
- 18) True
- 19) {a, b}, {a, c}, {a, d}, {a, e}, {b, c}, {b, d}, {b, e}, {c, d}, {c, e}, {d, e}
- 20) TRUE

$$7.8\% = 3.8$$