MGF Notes / Week 7 - Sets Test Review

Week 7 - Sets Test Review Questions

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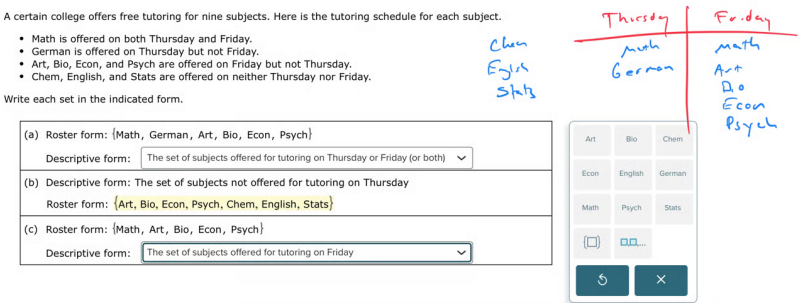
Question 2: Writing sets for a real-world situation using descriptive and roster forms



Question 3: Identifying infinite sets and determining cardinalities of finite sets

For each given set, determine if the set is finite or infinite. If finite, give the cardinality.

Set	Is the set finite or infinite?
(a) The set of even numbers in $\{3,5,7\}$	● finite cardinality: 3 ○ infinite
(b) $\{10,20,30,...\}$	○ finite cardinality: ☐ ● infinite
(c) $\{c,d,f,g,h,k,n\}$	● finite cardinality: 7 ○ infinite

Cardinality - count how many in each set

Question 4: Determining the number of subsets for a real-world situation

Jane got a train ticket valid for the eight cities listed below. She can choose to visit some or none of these cities. She doesn't have time to visit all of them.

Amsterdam, Brussels, Cologne, Duisburg, Lille, Paris, Rotterdam, Utrecht

In how many different ways can Jane choose the cities to visit? (The order of the cities chosen doesn't matter.)

☐

Question 5: Finding sets and complements of sets

For the universal set, $U=\{p,\ q,\ r,\ x,\ y,\ z\}$, complete the parts below.
Write your answers in roster form or as ∅.

(a) Suppose we know that $A' = \{p, x, y\}$. Then what would A have to be?

$A = \{q, r, z\}$

(b) Suppose $B = \{r, x, y, z\}$. Then what is B'?

$B' = \{p, q\}$

Question 6: Union and intersection of finite sets

Sets L and D are defined as follows.

$L = \{a, g, h\}$
$D = \{c, d, f\}$

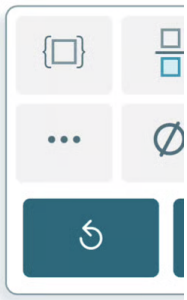
Answer each part below. Write your answer in roster form or as $\varnothing$.

(a) Find the union of L and D.

$L \cup D = \{a, g, h, c, d, f\}$

(b) Find the intersection of L and D.

$L \cap D = \varnothing$



Question 7: Unions, intersections, and complements involving 2 sets

Sets C and D are subsets of the universal set U.
These sets are defined as follows.

$U = \{1, 3, 4, 6, 7, 8\}$
$C = \{3, 4, 7\}$
$D = \{1, 4, 7\}$

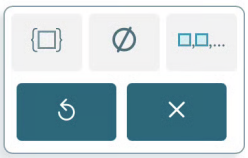
$C \cap D = \{4, 7\}$

$C' = \{1, 6, 8\}$

Find the following sets.
Write your answer in roster form or as $\varnothing$.

(a) $(C \text{ and } D)' = \{1, 3, 6, 8\}$

(b) $C' \text{ OR } D = \{1, 4, 6, 7, 8\}$



Question 8: Unions and intersections involving the empty set or universal set

Set A and the universal set U are defined as follows.

$U = \{p, q, r, x, y, z\}$
$A = \{p, q, x\}$

$A' = \{r, y, z\}$

Find the following sets.
Write your answer in roster form or as $\varnothing$.

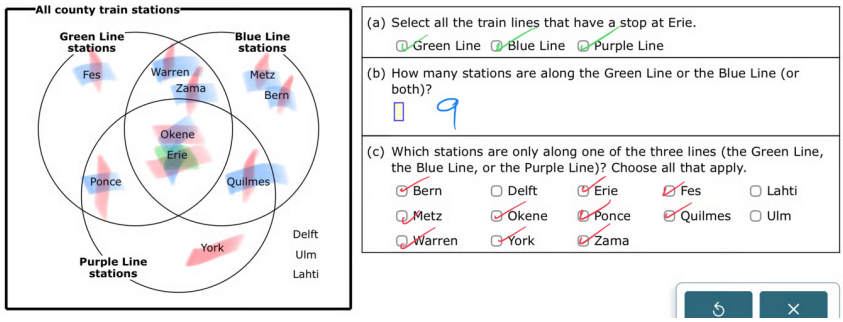
$A \cup \varnothing = A$ $\quad A \cup U = U$
$A \cap \varnothing = \varnothing$ $\quad A \cap U = A$

(a) $A' \cap \varnothing = \varnothing$

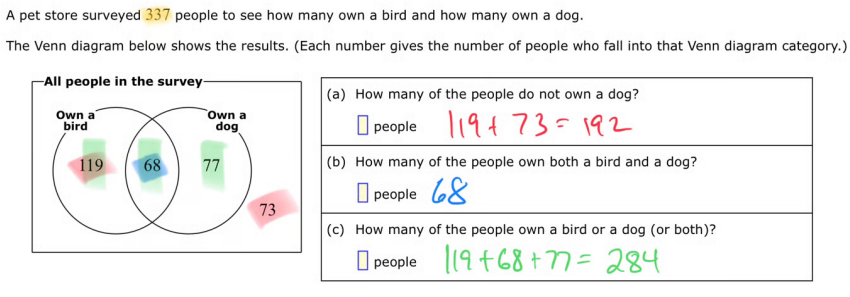
(b) $A \cup U = U$

I didn't do this on the video, but in ALEKS you can't write U for Universal. You need to write it in roster form so (b) would be {p a, r, x, y, z}

Question 9: Interpreting a Venn diagram with 3 sets for a real-world situation

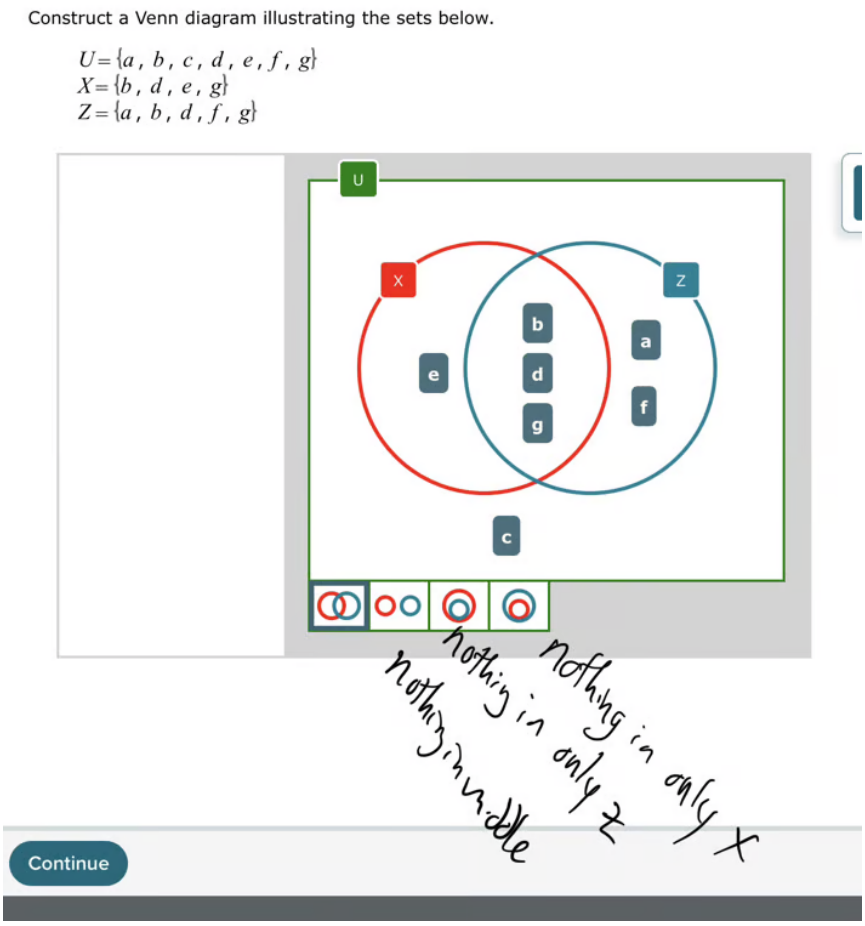


Question 10: Interpreting Venn diagram cardinalities with 2 sets for a real-world situation



I can't add. It's 119+68+77=264

Question 11: Constructing a Venn diagram with 2 sets

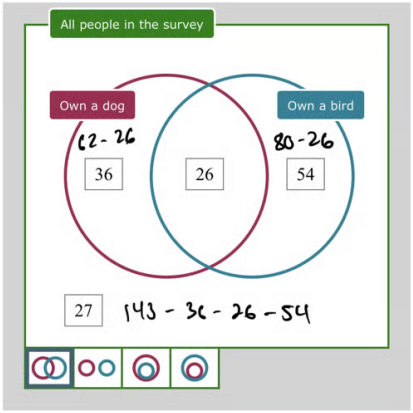


Question 12: Constructing a Venn diagram with 2 sets to solve a word problem

A pet store surveyed 143 people to gather information about the types of pets they own. The table below gives the res

	Number of people
Own a dog	62
Own a bird	80
Own both a dog and a bird	26

Construct a Venn diagram illustrating these results. Then answer the questions.



How many people own a bird but not a dog?

54 people

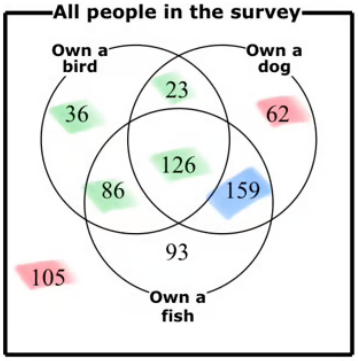
How many people own a dog or a bird (or both)?

116 people 36+26+54

Question 13: Interpreting Venn diagram cardinalities with 3 sets for a real-world situation

A pet store surveyed 690 people to see how many own a bird, how many own a dog, and

The Venn diagram below shows the results. (Each number gives the number of people w



(a) How many of the people own a bird?

people 36+23+86+126 = 271

(b) How many of the people own neither a bird nor a fish?

people 62+105 = 167

(c) How many of the people own both a dog and a fish, but don't own a bird?

people 159

Question 14: Constructing a Venn diagram with 3 sets to solve a word problem

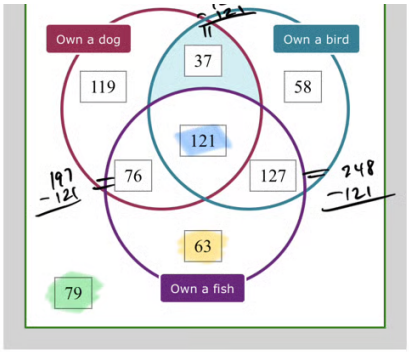
A pet store conducted a survey to gather information about the types of pets people own. Here are the results.

- 680 people were surveyed in all 680 - 119 - 37 - 76 - 121 - 58 - 127 = 6
- 343 of the people own a bird 343 - 37 121 - 127 = 58
- 353 of the people own a dog 353 - 76 - 121 - 37 = 119
- 158 of the people own both a dog and a bird
- 248 of the people own both a bird and a fish
- 197 of the people own both a dog and a fish
- 121 of the people own all three types of pets (dog, bird, fish)
- 79 of the people don't own any of these three types of pets (dog, bird, fish)

work bottom up

Construct a Venn diagram illustrating these results. Then answer the question.

How many of the people own both a bird and a dog, but don't own a fish?



37 people

2^n n=8 cities

$2^8 = 256$

256 − 1 can't visit all

255

#5 - Show your work for **PART A.**

What is the original set?

$A = \{q, r, z\}$

What is the complement set?

$A' = \{p, x, y\}$

#4 - Show your work.

#6 - In your own words, write how you tell the difference between union and intersection?

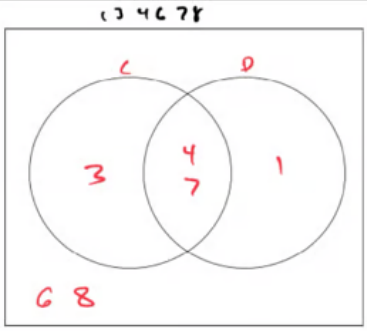
Union: ∪ (cup) or

bring together marriage

combine

Intersection: ∩ and

share overlap



#7 - Using your problem, label the venn diagram.

126 people own all 3 types of pets

79 people do not own any of these 3 pets

#13 - What does the most interior number represent? The number in the middle of all three circles. Write your answer in context of the problem.

#14 - What does the number on the OUTSIDE of the circles represent? Write your answer in context of the problem.