

Chapter 2 Test: Topics to review.

A. Set Relationships

You should be able to identify how two sets are related: if they are equal, equivalent, disjoint or one set is a subset of the other (or none of the above).

A1. Using attribute pieces, identify relationships between these sets.

T & BT
L & M
BT & M

BH & O
L & S
P & Y

ST & R
S & M

A2. Use the attribute pieces to create the following sets (each number is a separate problem).

1. Give an example of three equivalent disjoint sets. List their elements.
2. Give three sets A, B, C so that $B \subset A$, $C \subset A$ and B and C are disjoint.
3. Give three sets A, B, C so that $A \subset B \subset C$.

Note: The letters A, B, C are just placeholders here, you need to think about attribute pieces and sets you can create from them. For example, your answer may look like this: "These relationships would hold in this case: A is the set of all large pieces, B is the set of all blue triangles and C is the set of all yellow squares".

B. Set Operations

B1. You should be able to construct a new set given two (or more) sets and operations on them. Use attribute pieces.

$L \cap R =$

$BT \cup BH \cup BC \cup BQ =$

$(L - R) - Y =$

$S \cup L =$

$H - NR =$

$M \cap R =$

$S \cap L =$

$\overline{NR} =$

$(M \cup BT) - \bar{B} =$

B2. In the book, see problem #7 on pages 32-34

B3. More problems on shading the areas in Venn Diagrams:

Draw a Venn Diagram (two or three intersecting sets, depending on the problem. You may also print a Venn Diagram template from my website). Label the sets A, B, C (or A, B, if just two sets are involved). Shade the appropriate regions on the Venn Diagrams:

- $A \cap C$
- $B - A$
- $C - A$

- \bar{B}
- $(A \cap B) \cap C$
- $(A \cap B) \cup C$

- $A \cap (B \cup C)$

C. Sets, Reasoning and Problem solving

You should be able to solve word problems involving finding number of elements of given sets and use Venn Diagrams to explain your solution. (Two solved problems can be found at <http://www.purplemath.com/modules/venndiag4.htm> .)

C1. In a class with 16 students, 8 people played guitar, 3 people played piano and guitar and 4 people didn't play either of these two instruments. How many people played piano?

C2. In a music club with 15 members, 7 people played piano, 6 people played guitar, and 4 people didn't play either of these two instruments. How many people played both piano and guitar?

C3. There were 55 people at a high school reunion. If 16 people had college degrees, 12 people had college degrees and were married, and 14 people were single and did not have college degrees, how many people were married and did not have college degrees?

C4. Of the 22 fast-food businesses in a small city, the number that have a drive-up window, outside seating, or delivery service is summarized as follows:
 7 have delivery service, 15 have outside seating, 13 have a drive-up window, 9 have a drive-up window and outside seating, 3 have outside seating and delivery service, 3 have delivery service and a drive-up window, 2 have all three services.
 How many of these businesses have only a drive-up window?

C5-8. Piano Guitar Violin variations:

Guitar..... 9
 Piano and Guitar..... 5
 Guitar and Violin..... 4
Piano, Guitar & Violin.... 3
 Guitar ONLY ?

Piano..... 11
 Guitar..... 10
 Violin..... 10
 Piano and Guitar..... 5
 Piano and Violin..... 4
Piano, Guitar & Violin.... 3
 Piano ONLY ?

Piano..... 8
 Guitar..... 13
 Violin..... 13
 No instrument..... 5
 Piano and Guitar..... 6
 Piano and Violin..... 5
 Guitar and Violin..... 7
G & V but not Piano.... 3
 How many students in the class ?

All students in the class 20
 Piano..... 11
 Guitar..... 10
 Violin..... 9
 Piano and Guitar..... 6
 Guitar and Violin..... 5
 Piano and Violin..... 4
Piano, Guitar & Violin.... 2
 No instrument ?