

11.4 Venn Diagrams

(Notes Handout)

Goal: Solve mutually exclusive events using Venn Diagrams

Feb 19-9:25 PM

REVIEW!!!

You have a deck of 52 cards.

- Explain why the events "choosing a club" and "choosing a heart" are mutually exclusive.
they can't be both suits
- What is the probability of choosing a club or a heart?
 $\frac{13}{52} + \frac{13}{52} = \frac{26}{52} = \frac{1}{2}$

The numbers 1-9 are written on cards and placed in a bag. Find each probability.

- choosing a multiple of 3 or an even number
3, 6, 9 2, 4, 6, 8
 $\frac{3}{9} + \frac{4}{9} - \frac{1}{9}$
- choosing a multiple of 4 or an even number
4, 8 2, 4, 6, 8
 $\frac{2}{9} + \frac{4}{9} - \frac{2}{9} = \frac{4}{9}$

Feb 17-10:17 AM

A **Venn diagram** is a graphical representation comparing and contrasting objects in a set.

A Venn diagram can picture the relationship between two or more sets of data. In such a diagram, the region within a closed shape represents a set of data.

U is called the universal set or the universe. In any discussion, the universal set must be specified and it is essential that it contain each set being dealt with as a subset.

Given:
Let U = {girls}
Let X = {girls 16 years old}

Let Y = {girls with long hair}
Let Z = {girls 17 years old}

Shaded Region:
Girls not 16 years old

Girls 16 years old and girls 17 years old

Let's try:
All girls EXCEPT those who are 16 years old with long hair.

Girls 16 years old or having long hair or both

Feb 17-12:12 PM

Sketch a Venn Diagram to indicate a relationship between the following sets.

- U = {standard deck of cards}
A = {red cards}
B = {black cards}
C = {diamonds}
- U = {letters of the alphabet}
A = {vowels}
B = {the letters M, A, T, H}

Feb 18-9:52 AM

Indicate what numbered regions (1, 2, 3, and/or 4) you would shade to show each situation.

- All male English teachers 1 & 2
- Males over 6 feet tall 2 & 3
- Males who are over 6 feet tall and who teach English 2
- Males who either teach English or are over 6 feet tall (but not both) 1 & 3
- Males who are not English teachers 3 & 4
- Males who are neither over 6 feet tall nor English teachers 4
- Males who are not both an English teacher and over 6 feet tall 1, 3, 4
- Males over 6 feet tall who are not English teachers 3

Feb 17-3:28 PM

Of 1560 students surveyed, 840 were seniors and 630 read a daily paper. The rest of the students were juniors. Only 215 of the paper readers were juniors. What is the probability that a student was a senior or read a daily paper?

$\frac{840 + 630 - 415}{1560} = \frac{1055}{1560}$

$\frac{840}{1560} + \frac{630}{1560} - \frac{415}{1560} = \frac{1055}{1560}$

$\frac{840}{1560} - \frac{415}{1560} = \frac{425}{1560}$

Step 1 Use a Venn diagram.
Label as much information as you know. Being a senior and reading the paper are inclusive events.

Feb 17-10:29 AM

