

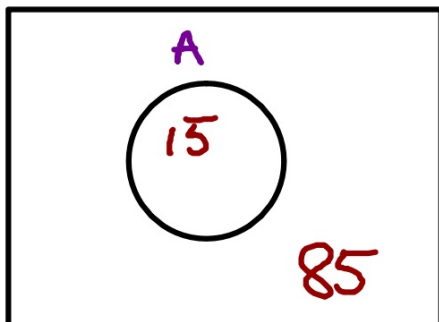
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VISION	WALKING ICE	STORM	SPOT	ONCE 
PROMISE	VIOLETS	EKA'S PINEAPPLE CAKE	DOOR	GET A WORD IN
COUNTRY COUNTRY	 3.14159	GROUND FEET FEET FEET FEET	RAKEN	BUSINES

3.2 Venn Diagrams

def: a diagram representing data or probabilities using circles, common elements of sets are represented using overlapping circles.

Simple Example

Of 100 students, 15 of them are in AVID



A = # of students in AVID

U = total # of students

* always work from the inside → out

Choose a student at random. The probability that student is in AVID is: $P(A) = \frac{n(A)}{n(U)} = \frac{15}{100} = \frac{3}{20}$

The probability that they are NOT in AVID is: $1 - P(A) = \frac{17}{20}$

The Complement of A

A' (read "A not") is not in A, but is in U .

A' is the complement of A

$$n(A) + n(A') = n(U)$$

Thus, $P(A) + P(A') = 1$ and,
 $P(A') = 1 - P(A)$

Symbols:



- union

"or"



- intersect

"and"

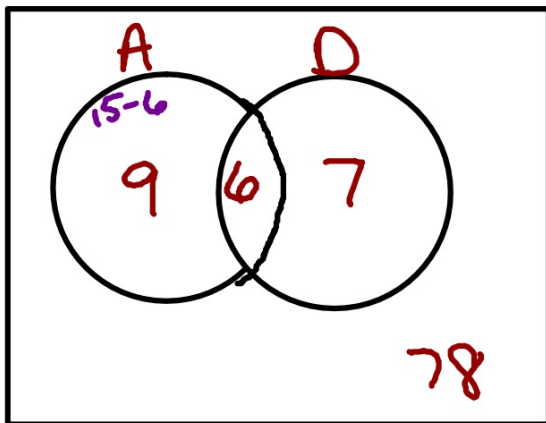
Intersection of Events

100 students = U
15 in AVID = $n(A)$

7 are Full Diploma, but not in AVID = $n(D \cap A')$

6 are full diploma, and in AVID = $n(D \cap A)$

Full DP intersect
Not in AVID



U A student is chosen at random

- $P(\text{Both DP and Avid})$

$$P(A \cap D) = \frac{6}{100}$$

- $P(\text{not full DP})?$

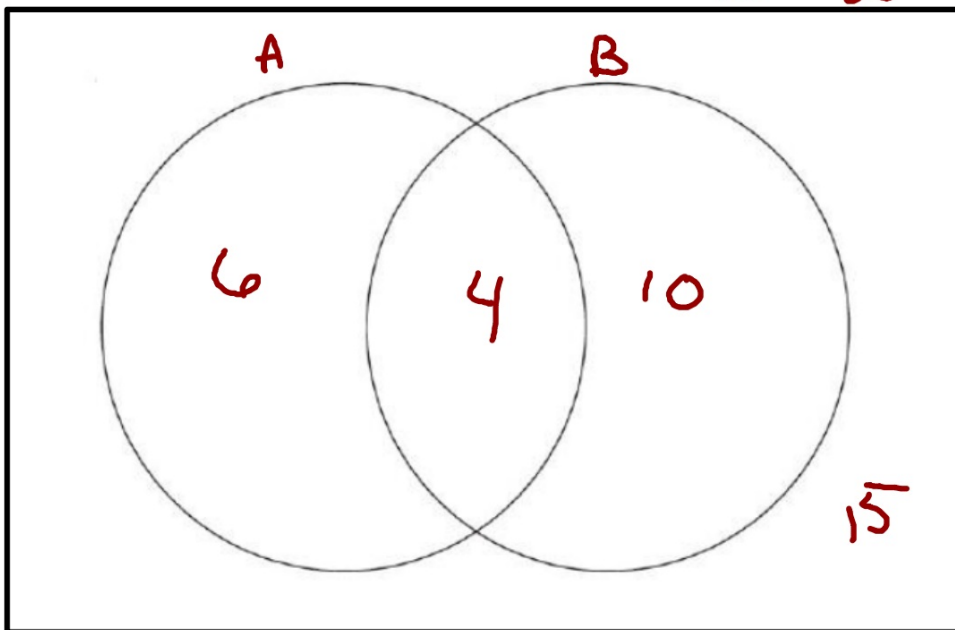
$$P(D') = 1 - P(D)$$

$$= 1 - \frac{13}{100} = \frac{87}{100}$$

- 1 In a group of 35 children, 10 have blonde hair, 14 have brown eyes, and 4 have both blonde hair and brown eyes. Draw a Venn diagram to represent this situation. A child is selected at random. Find the probability that the child has blonde hair or brown eyes.

A = Blond
B = Brown eyes

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) \\ = \frac{10}{35} + \frac{14}{35} - \frac{4}{35} = \frac{20}{35}$$



HW 3B
p. 71
#2-4

5 The universal set U is defined as the set of positive integers less than or equal to 15. The subsets A and B are defined as:

$$A = \{\text{integers that are multiples of 3}\}$$

$$B = \{\text{integers that are factors of 30}\}$$

a List the elements of

i A

ii B

b Place the elements of A and B in the appropriate region on a Venn diagram.

c A number is chosen at random from U .

Find the probability that the number is

i both a multiple of 3 and a factor of 30,

ii neither a multiple of 3 nor a factor of 30.

