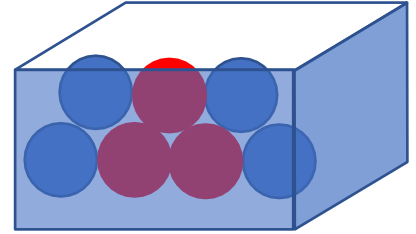




Random Experiment

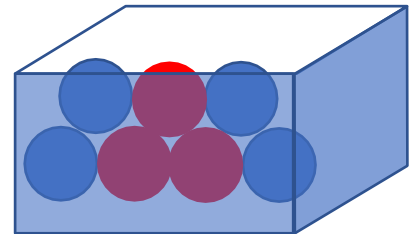
Any process that generates a set of Data



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Sample Space

The set of all outcomes of experiments



Discrete and Continuous Sample Spaces

Discrete sample space:

Continuous sample space:

Examples:

Waiting time for the bus

Events

Subset of the sample space

Examples:

Odd numbers of a dice

Even numbers of a dice

Red ball from box

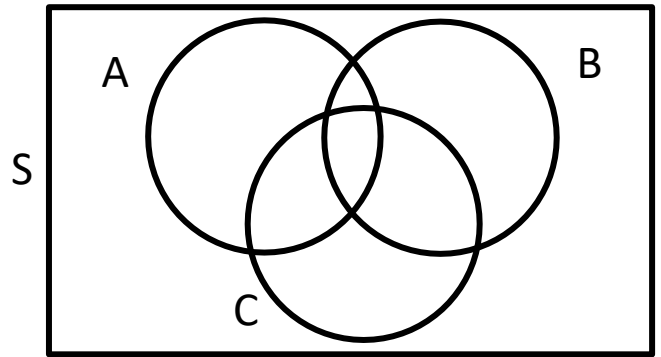
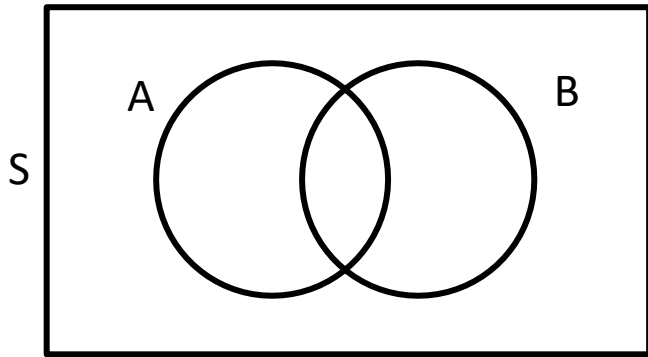
The union of two events:

The intersection of two events:

The complement of an event (E' , or E^c):



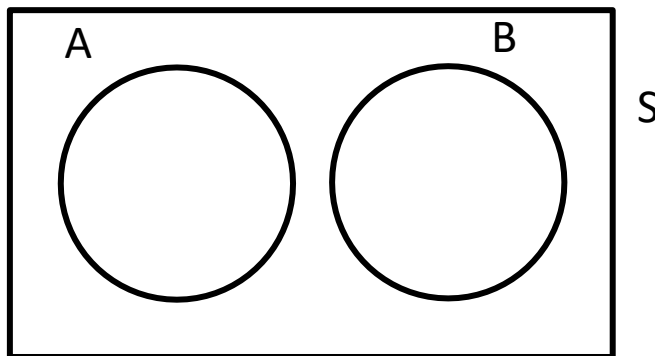
Venn diagrams



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Mutually Exclusive Events



Review

Distributive law:

$$(A \cup B) \cap C = (A \cap C) \cup (B \cap C) \quad (A \cap B) \cup C = (A \cup C) \cap (B \cup C)$$

DeMorgan's laws:

$$(A \cup B)' = A' \cap B' \quad \text{and} \quad (A \cap B)' = A' \cup B'$$

Commutative laws:

$$A \cap B = B \cap A \quad \text{and} \quad A \cup B = B \cup A$$

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Provide a reasonable description of the sample space for the following random experiments.

2.1.3 In the final inspection of electronic power supplies, either units pass or three types of nonconformities might occur: functional, minor, or cosmetic. Three units are inspection

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Provide a reasonable description of the sample space for the following random experiments.

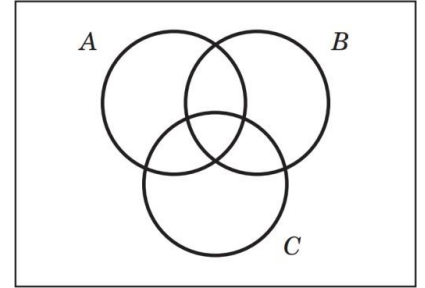
2.1.6 The time until a service transaction is requested of a computer to the nearest millisecond

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2.1.13 Three events are shown on the Venn diagram in the following figure: Reproduce the figure and shade the region that corresponds to each of the following events.

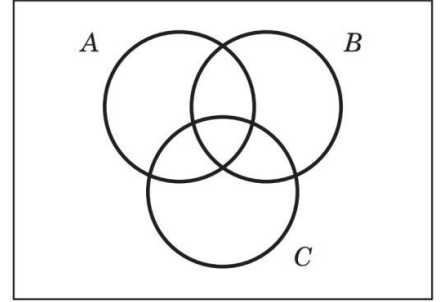
a. A'



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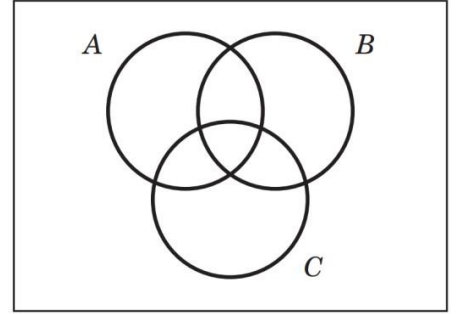
b. $A \cap B$



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c. $(A \cap B) \cup C$

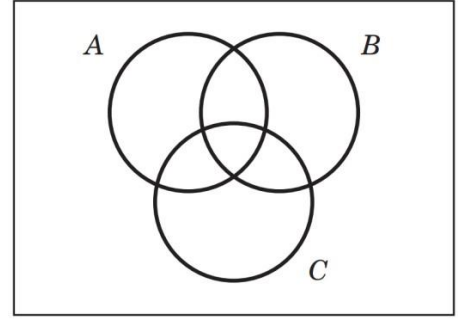


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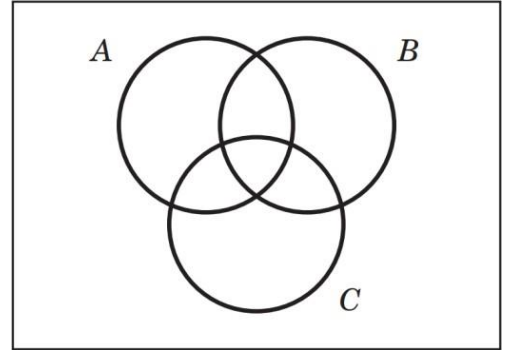
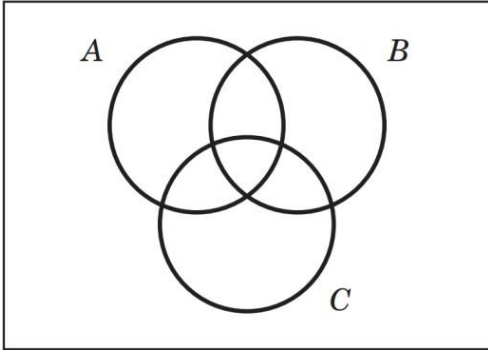
d. $(B \cup C)'$



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e. $(A \cap B)' \cup C$



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A digital scale that provides weights to the nearest gram is used. Let A denote the event that a weight exceeds 11 grams, let B denote the event that a weight is less than or equal to 15 grams and let C denote the event that a weight is greater than or equal to 8 grams and less than 12 grams. Describe the following events.

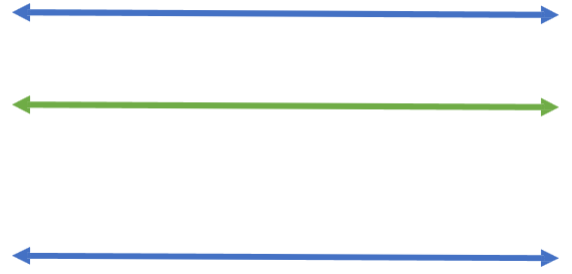
- What is the sample space for this experiment?
- $A \cup B$



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c. $A \cap B$



d. A'

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e. $A \cup B \cup C$



f. $(A \cup C)'$



g. $A \cap B \cap C$

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h. $B' \cap C$



Samples of emissions from three suppliers are classified for conformance to air-quality specifications. The results from 100 Samples are summarized as follows:

		Conforms	
		Yes	No
Supplier	1	22	8
	2	25	5
	3	30	10

Let A denote the event that a sample is from supplier 1, and let B denote the event that a sample conforms to specifications. Determine the number of samples in $A' \cap B$, B' , and $A \cup B$.

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