Probability: OR

Objectives

1. Calculate probabilities using the Addition Rule
2. Calculate the complement of an event
3. Calculate "at least" probabilities
4. Calculate the odds of an event

AND vs. OR

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In this section, we will focus on the word *or*, which will mean adding probabilities.

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$$= \frac{1}{3}$$

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In the previous example, the events "rolling a 4" and "rolling a 5" were *mutually exclusive*.

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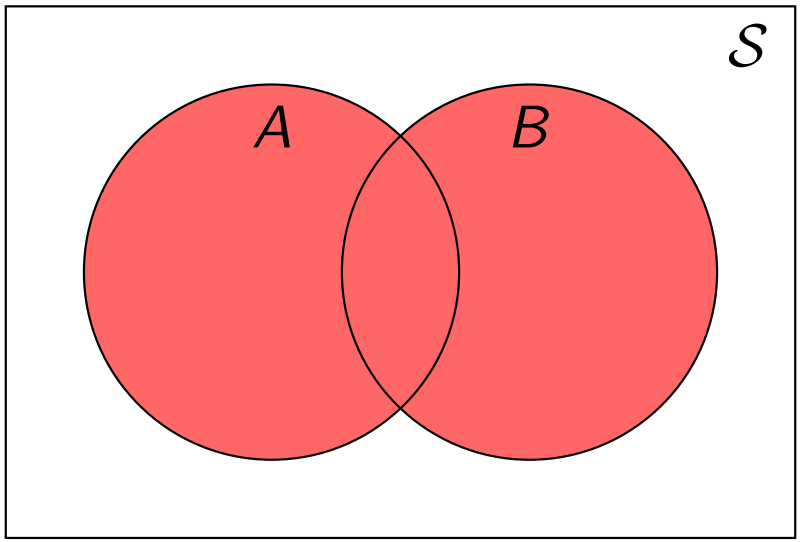
$$P(A \text{ or } B) = P(A) + P(B)$$

Venn Diagram – OR



$P(A \text{ or } B)$

Example 2

The table below lists the types and numbers of cars sold at Lemon Autos along with their ages. Find each probability.

	0–2	**3–5**	**6–10**	**Over 10**	**Total**
Foreign	37	21	12	30	100
Domestic	35	23	11	31	100
Total	72	44	23	61	200

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$$\begin{aligned} P(\text{0–2 or over 10}) &= P(0-2) + P(\text{over 10}) \\ &= \frac{72}{200} + \frac{61}{200} \\ &= \frac{133}{200} \end{aligned}$$

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	0–2	3–5	6–10	Over 10	Total
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(b) If a car is randomly selected, what is the probability that the car is 3–5 years old or a domestic car?

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Example 2 $P(3-5$ or domestic)

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So, we need to subtract 23 cars from our original total of 144

$$P(3-5 \text{ years old or domestic}) = \frac{121}{200}$$

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$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

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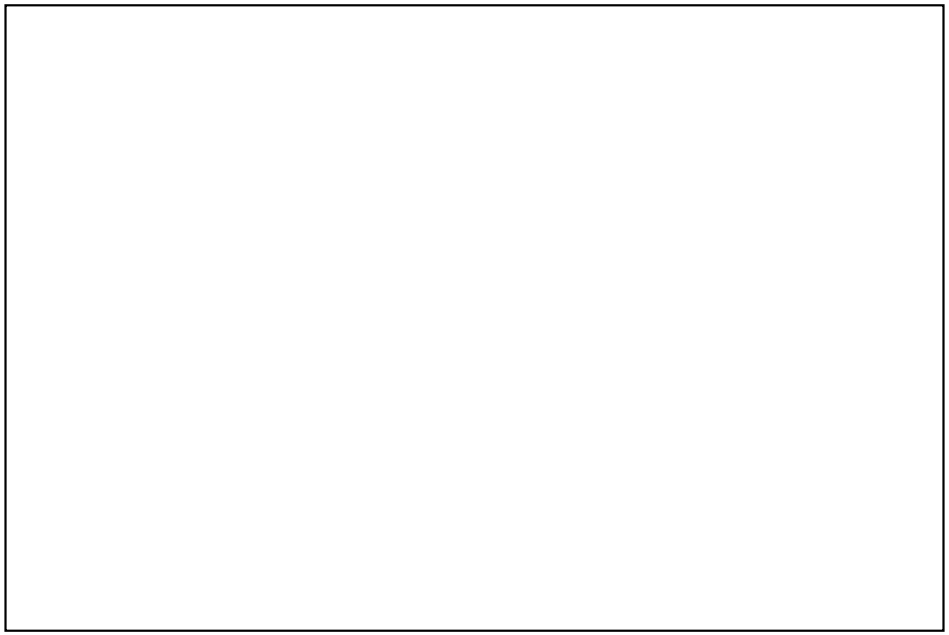

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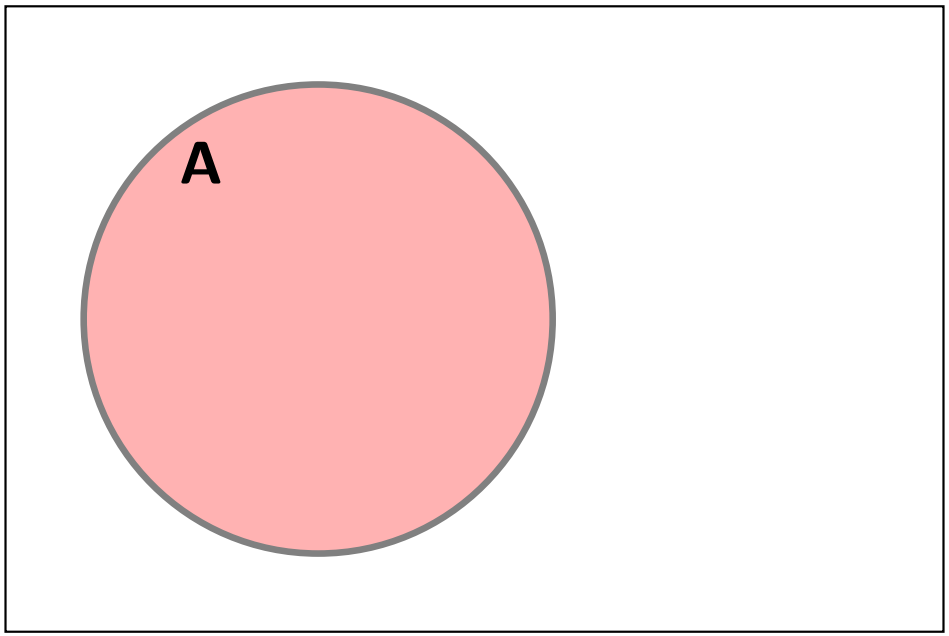

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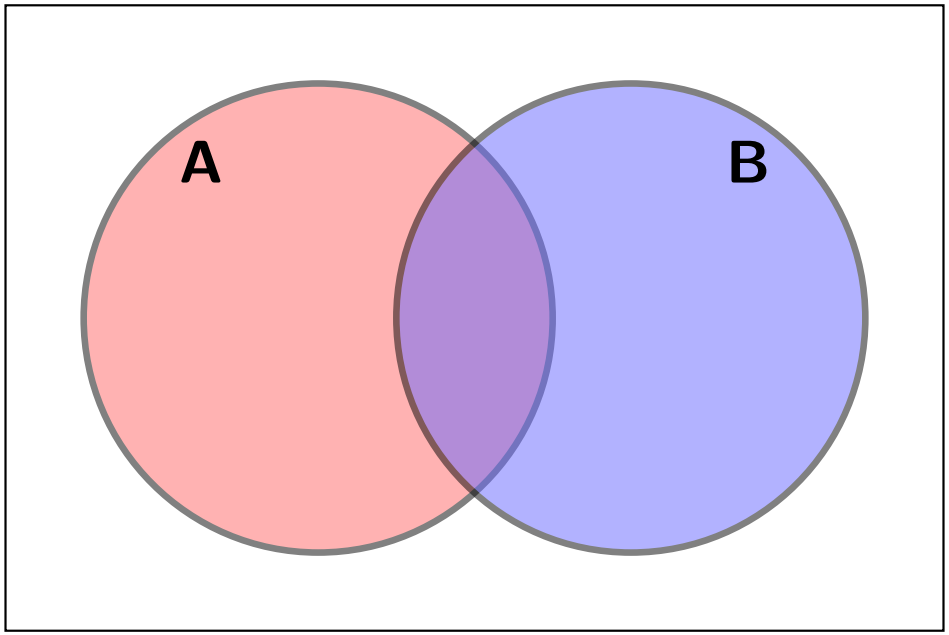

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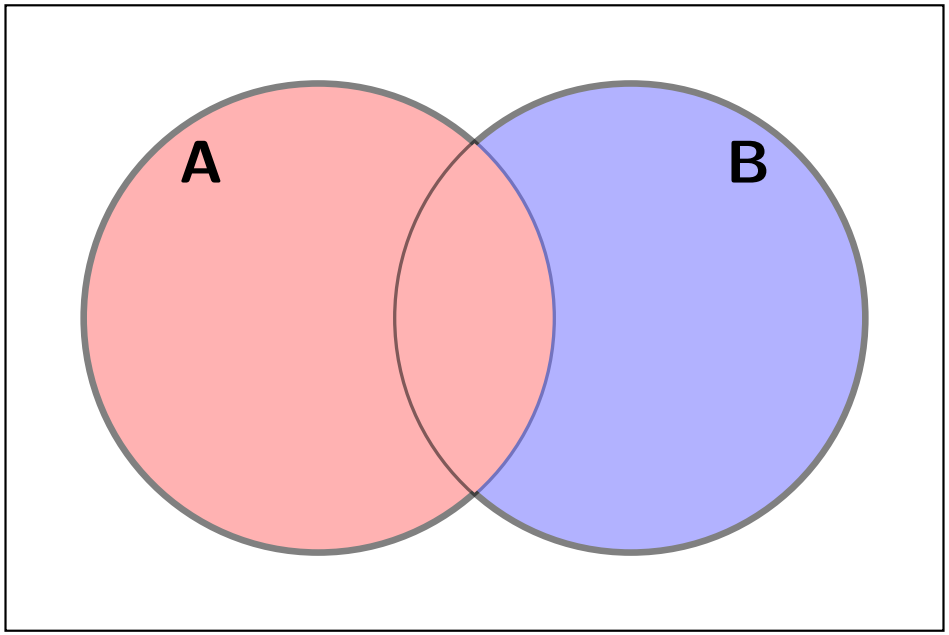

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