

# 10-10 Probability of Compound Events

(Pages 535–538)

When two events cannot happen at the same time, they are **mutually exclusive**. When two events are **inclusive**, they can happen at the same time.

<b>Finding Probability</b>	<ul style="list-style-type: none"> <li>To find the probability of one or the other of two <i>mutually exclusive</i> events, add the probability of the first event to the probability of the second event. <math>P(A \text{ or } B) = P(A) + P(B)</math></li> <li>To find the probability of one or the other of two <i>inclusive</i> events, add the probability of the first event to the probability of the second event and subtract the probability of both events happening. <math>P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)</math></li> </ul>
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## EXAMPLE

You choose a puppy at random from a litter of 2 brown males, 1 brown female, 1 black male, and 1 black female. What is  $P(\text{female or brown})$ ?

Since it is possible to get a female puppy that is also brown, these events are inclusive.

$$P(\text{female}) = \frac{2}{5} \quad P(\text{brown}) = \frac{3}{5} \quad P(\text{female and brown}) = \frac{1}{5}$$

$$P(\text{female or brown}) = P(\text{female}) + P(\text{brown}) - P(\text{female and brown})$$

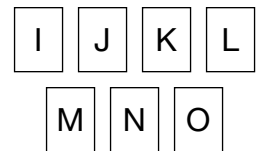
$$= \frac{2}{5} + \frac{3}{5} - \frac{1}{5} \text{ or } \frac{4}{5}$$

## PRACTICE

Determine whether each event is mutually exclusive or inclusive. Then find the probability.

1. A card is drawn from the cards at the right.

- a.  $P(J \text{ or } K)$                       b.  $P(L \text{ or } M \text{ or } N)$   
 c.  $P(N \text{ or a consonant})$         d.  $P(L \text{ or a vowel})$

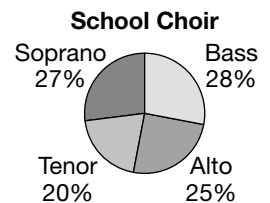


2. A four-sided game piece numbered 1 through 4 is rolled.

- a.  $P(1 \text{ or even})$                       b.  $P(2 \text{ or less than } 3)$                       c.  $P(3 \text{ or odd})$   
 d.  $P(1 \text{ or } 5)$                               e.  $P(4 \text{ or a factor of } 10)$                       f.  $P(1 \text{ or more than } 1)$



3. **Standardized Test Practice** The graph shows a breakdown of the sections in the school choir. If you randomly meet someone in the choir, what is the probability that they sing in the tenor section?



- A 20                                      B  $\frac{1}{4}$                                       C 2                                      D  $\frac{1}{5}$

<p><b>Answers:</b> 1a. mutually exclusive; <math>\frac{2}{5}</math> 1b. mutually exclusive; <math>\frac{2}{3}</math> 1c. inclusive; <math>\frac{7}{5}</math> 1d. mutually exclusive; <math>\frac{7}{3}</math> 2a. mutually exclusive; <math>\frac{4}{3}</math> 2b. inclusive; <math>\frac{2}{1}</math> 2c. inclusive; <math>\frac{2}{1}</math> 2d. mutually exclusive; <math>\frac{4}{1}</math> 2e. mutually exclusive; <math>\frac{4}{3}</math> 2f. mutually exclusive; 1 3. D</p>
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