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Exercises

1. An experiment consists of selecting a number at random from the set of numbers $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. Find the probability that the selected number is:

    1. less than 4
    2. odd
    3. less than 4 or odd.

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2. An experiment consists of tossing a coin two times and observing the sequence of heads and tails. Each of the four outcomes has the same probability of occurring.

    1. What is the probability that "HH" is the outcome?
    2. What is the probability of the event "at least one head"?

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3. The colors in a bag of M&M's have the probability distribution in the following table. What is the probability of randomly selecting a brown, orange, or red M&M?

Brown	0.13
Yellow	0.14
Red	0.13
Orange	0.20
Blue	0.24
Green	0.16

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4. An experiment with the outcomes $s_1, s_2, s_3, s_4, s_5, s_6$ has the following probability distribution.

s_1	0.05
s_2	0.25
s_3	0.05
s_4	0.01
s_5	0.63
s_6	0.01

Let $E = \{s_1, s_2\}$ and $F = \{s_3, s_5, s_6\}$.

1. Find $Pr(E)$ and $Pr(F)$.

2. Find $Pr(E')$.

3. Find $Pr(E \cap F)$.

4. Find $Pr(E \cup F)$.

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5. The probability that Alice beats Ben in a game of tennis is twice the probability that Ben beats Alice. Determine the two probabilities.

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6. At a certain college, the probability that a student selected at random is taking a mathematics course is $\frac{1}{2}$, the probability that he or she is taking a computer science course is $\frac{3}{8}$, and the probability that he or she is taking either a mathematics or a computer science course is $\frac{3}{4}$. What is the probability that a student selected at random is taking both types of courses?

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7. At a certain college, the probability that a student selected at random is taking a mathematics course is $\frac{1}{2}$, the probability that he or she is taking a computer science course is $\frac{3}{8}$, and the probability that he or she is taking either a mathematics or a computer science course is $\frac{3}{4}$. What is the probability that a student selected at random is taking both types of courses?

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8. The odds of an adult in the United States owning a passenger car are 39 to 12. What is the probability that an adult in the United States owns a passenger car?

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9. A basketball team has eight players. What is the probability that at least two of them were born on the same day of the week?