Lesson 9-1

Example 1 Find Probability
What is the probability of rolling a number greater than four on a number cube marked with 1, 2, 3, 4, 5, and 6 on its faces?

P(number greater than four) $= \dfrac{\text{numbers greater than four}}{\text{total numbers possible}}$

$\qquad\qquad\qquad\qquad\quad = \dfrac{2}{6}$ Two numbers greater than four: 5 and 6.

$\qquad\qquad\qquad\qquad\quad = \dfrac{1}{3}$ Simplify.

Example 2 Find Probability
MONOPOLY Sam is playing a game of Monopoly with his friends. When it is his turn, he needs to roll the two number cubes and roll a sum that is less than six. What is the probability of this happening?

List all the possible outcomes. Then, find the pairs that have a sum less than six.

1, 1	**2, 1**	**3, 1**	**4, 1**	5, 1	6, 1
1, 2	**2, 2**	**3, 2**	4, 2	5, 2	6, 2
1, 3	**2, 3**	3, 3	4, 3	5, 3	6, 3
1, 4	2, 4	3, 4	4, 4	5, 4	6, 4
1, 5	2, 5	3, 5	4, 5	5, 5	6, 5
1, 6	2, 6	3, 6	4, 6	5, 6	6, 6

There are 36 possible outcomes and 10 of them are favorable. So, the probability of Sam rolling a sum that is less than six is $\dfrac{10}{36}$, or $\dfrac{5}{18}$.

Example 3 Find a Complementary Event
Refer to Example 2. Find the probability of *not* rolling a sum less than six.

$P(A) + P(\text{not } A) = 1$

$\dfrac{5}{18} + P(\text{not } A) = \quad 1$ Substitute $\dfrac{5}{18}$ for $P(A)$.

$-\dfrac{5}{18} \qquad\qquad\quad -\dfrac{5}{18}$ Subtract $\dfrac{5}{18}$ from each side.

$\qquad\qquad P(\text{not } A) = \quad \dfrac{13}{18}$

So, the probability of not rolling a sum of less than six is $\dfrac{13}{18}$. This is the same probability as rolling a sum that is six or greater.