

Section 9-1 and 9-2 **Probability**

**Random Experiment**—act of doing something and there is no way of telling beforehand how the result will come out.

If the outcomes of a random experiment are equally likely, then

$$\text{Probability} = \frac{\text{number of outcomes in the event (\# of successes)}}{\text{total number of possibilities (sample space)}}$$

symbolically:  $P(E) = \frac{n(E)}{n(S)}$

**Cards** (52 card deck, 13 each of diamonds, hearts, clubs and spades) Face cards: jack, queen, king

1.  $P(\text{jack}) = \frac{4}{52} = \frac{1}{13}$

2.  $P(\text{queen of hearts}) = \frac{1}{52}$

3.  $P(\text{red card}) = \frac{26}{52} = \frac{1}{2}$

4.  $P(\text{face card}) = \frac{12}{52} = \frac{3}{13}$

5.  $P(2 \text{ or } 5) = \frac{8}{52} = \frac{2}{13}$   
 $\frac{4}{52} + \frac{4}{52} = \frac{8}{52}$

6.  $P(\text{card is between 7 and 9 inclusive}) = \frac{12}{52} = \frac{3}{13}$

**Dice** (rolling 2 dice)

Sample space =

	1	2	3	4	5	6
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
4	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
5	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
6	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

7.  $P(\text{sum of 5}) = \frac{4}{36} = \frac{1}{9}$

8.  $P(\text{sum of 7}) = \frac{6}{36} = \frac{1}{6}$

9.  $P(\text{doubles}) = \frac{6}{36} = \frac{1}{6}$

10.  $P(\text{sum of 2}) = \frac{1}{36}$

11.  $P(\text{sum of 13}) = \frac{0}{36} = 0$

12.  $P(\text{sum is at most 8}) = \frac{26}{36} = \frac{13}{18}$

