

Probability and Odds

Probability of Success and Failure: If an event can succeed in s ways and fail in f ways, then $s+f =$ (the total number of possible outcomes)

The probability of success $P(S) = \frac{s}{s+f}$ and the probability of failure $P(F) = \frac{f}{s+f}$.

Ex 1: You roll a six-sided die. What is the probability that you will roll:

- a. a 5
- b. an even number
- c. a number greater than 4

- 1) define success – determine the number of ways to have success
- 2) determine the total number of possible outcomes
- 3) write a ratio of desired / total possible outcomes, in fraction form
- 4) simplify your result, or write in decimal or percent form, as appropriate for the problem

Ex 2: You are choosing socks from a drawer in the dark. The drawer contains 5 white socks, 4 black socks and 6 grey socks. Determine each probability.

- a. P(grey)
- b. P(white)
- c. P(not black)



Odds of success = $s:f$ Odds of failure = $f:s$

Ex 3: You roll a six-sided die. What are the odds of rolling:

- a. a 5
- b. an odd number
- c. a number divisible by 3



Ex 4: Choosing a sock from the drawer in example 2, what are the odds that you choose:

- a. a black sock
- b. a sock that is not black
- c. a white sock

Ex 5: If the odds of an event are 5:8, what is the probability of the event occurring?

Ex 6: You flip two coins. Write out the **sample space** – the set of all possible outcomes.



Probability and Odds Practice:

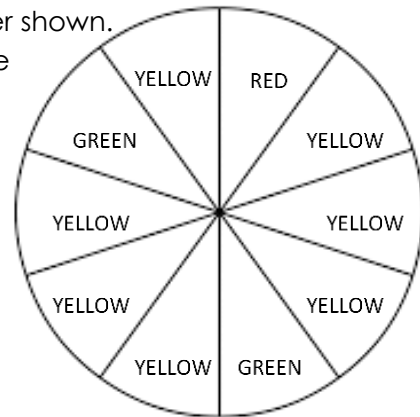
1. If the probability of rain tomorrow is 0.20, then what are the odds that it will **not** rain?

2. If one card is drawn from a standard deck, find the probability of getting these results.

a. An ace	b. A diamond
c. An ace of diamonds	d. A 4 or a 6
e. A 6 or a club	f. A heart or a club
g. A red card	h. A red queen

3. What are the odds of drawing a red queen?

4. At a special mall promotion, shoppers may spin the spinner shown. If they spin red, the customer wins \$50. If they spin green, the customer wins \$10. If they spin yellow, they win a coupon. Find the following probabilities.



- a. a customer wins \$10
 - b. a customer wins money
 - c. a customer wins a coupon
5. Choose one of the 50 states at random. What is the probability that it begins with A?

 6. Choose a number between 1 and 10 at random. What are the odds that it will be divisible by 4?

 7. In your class, 52% are female. Choose a student in class at random. What is the probability that the student is male?

 8. You flip two coins. What is the probability that the result is...

a. 2 heads	b. 1 heads and 1 tails	c. 2 tails
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Find the **Sample Space** (total number of possible outcomes) for each of the following situations. You are not determining probability or odds, just number of total possibilities.

- 1) A bag contains two red marbles and three blue marbles. You randomly pick a marble.
A) 10 B) 4 C) 5 D) 9
- 2) When a button is pressed, a computer program outputs a random odd number greater than 1 and less than 11. You press the button once.
A) 4 B) 8 C) 5 D) 1
- 3) A math quiz has five multiple choice questions. Each question has four options: A, B, C, and D.
- 4) You flip a coin nine times.
- 5) When a button is pressed, a computer program outputs a random even number greater than 0 and less than 8. You press the button six times.
- 6) A spinner can land on either red, blue, or green. You spin twice.
- 7) An ice cream stand offers single-scoop waffle-cones or bowls. Three flavors are available: strawberry, chocolate, and vanilla.
- 8) A spinner can land on either red, blue, green, yellow, purple, or orange. You flip a coin and then spin the spinner.
- 9) You flip a coin and then roll a six-sided die.
- 10) There is one quarter, one dime, and one nickel in your pocket. You randomly pick a coin from your pocket and place it on the counter. Then you pick a second coin from your pocket.