

Algebra 1 0.11 Simple Probability and Odds

Find the probability of simple events

Find the odds of simple events

imposs. $\downarrow$ certain
 $\downarrow$

% 0-100%

frac. 0-1

del. 0-1

50-50

→ probability

sample space

→ tree diagram

Fundamental Counting Principle

→ odds

~~number cubes (dice)~~

complementary events

How likely?

all the possibilities

1, 2, 3, 4, 5, 6

1 < H
2 < T
3 < H
4 < T
5 < H
6 < T

Ex. 1

$$P = \frac{\text{Success}}{\text{total}}$$

A number cube (die) is rolled. Find each probability.

a. Rolling a 1 or a 5

$$P_{1 \text{ or } 5} = \frac{2}{6} = \frac{1}{3}$$

b. Rolling an even number

$$P_e = \frac{3}{6} = \frac{1}{2}$$

Complements:

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

$$\frac{1}{3} + ? = 1$$

$$\frac{1}{2} + ? = 1$$

$$(\quad) + (\quad) = 1$$

100%

Ex. 2

28

A bowl contains 5 red chips, 7 blue chips, 6 yellow chips, and 10 green chips. One chip is randomly drawn.

a. $P(\text{blue}) = \frac{7}{28} = \frac{1}{4}$

b. $P(\text{red or yellow}) = \frac{11}{28}$

$0.392857143\dots$

c. $P(\text{not green}) = \frac{18}{28} = \frac{9}{14}$

≈ 0.39
 $\approx 39\%$

$1 - \frac{10}{28} =$

$\frac{28}{28} - \frac{10}{28}$

Tree diagram: counting possible outcomes

3 coats
2 hats

R W B
B C

R < B
C
W < B
C
B < B
C

R W B
B C R C B C

(R, B) (B, B)
(R, C) (B, C)
(W, B)
(W, C)

R	B
R	C
W	B
W	C
B	B
B	C

Ex. 3

School baseball caps come in blue, yellow or white. The caps have either the school mascot or the school's initials. Use a tree diagram to determine the number of different caps possible.

3

6



Fundamental Counting Principle

Ex. 4

An ice cream shop offers one, two, or three scoops of ice cream from among 12 different flavors. The ice cream can be served in a wafer cone, a sugar cone, or a dish. How many choices are possible?

3

$$3 \cdot 12 \cdot 3 = 108$$

F C P = mult to get total no. of options

Jimmy is creating a 3-digit password for his login on the school website. The password can include any digit from 0-9 ~~but the digits may not repeat~~. How many possible 3-digit passwords are there?

$$\underline{10} \cdot \underline{9} \cdot \underline{8} = 720$$

P-36
1-21 odd

The odds of an event occurring is the ratio that compares the number of ways an event can occur (success) to the number of ways it cannot occur (failure).

Ex. 5

A number cube is rolled.

Find the odds of rolling a number less than 3.