

SECTION 13.1

The table shows the number of students in your history class. Your teacher chooses one student at random to give an oral report.

What is the probability...

| | 9th Grader | 10th Grader |
|--------|------------|-------------|
| Male | 12 | 4 |
| Female | 8 | 6 |

- The student is female? $\frac{14}{30} = \frac{7}{15}$
- The student is male? $\frac{16}{30} = \frac{8}{15}$
- The student is a 9th grader? $\frac{20}{30} = \frac{2}{3}$
- The student is a 10th grader? $\frac{10}{30} = \frac{1}{3}$

Total = 12 + 4 + 8 + 6 = 30

A bag contains 8 white marbles, 6 red marbles, and 12 blue marbles. Find...

- The odds against choosing a white marble $\frac{18}{8} = \frac{9}{4}$
- The odds in favor of choosing a blue marble $\frac{12}{14} = \frac{6}{7}$
- The theoretical probability of choosing blue $\frac{12}{26} = \frac{6}{13}$

Total 26

You roll a number cube. What is the probability that you roll a multiple of 3? $\frac{2}{6} = \frac{1}{3}$

You choose a letter at random out of a bag that contains one of each letter of the alphabet. Find the probability that you choose the letter K. $\frac{1}{26}$

SECTION 13.2

Find the number of ways you can arrange all of the letters of the word BOUNDARY and then 3 of the letters of the word.

$8P_8 = 40,320$

$8P_3 = 336$

Evaluate.

${}^6P_3 = \frac{6!}{(6-3)!} = \frac{6!}{3!} = 120$

${}^{14}P_9 = \frac{14!}{(14-9)!} = 726,485,760$

There are 8 students auditioning for the main role in a school play. The order of the student auditions is chosen at random. Find the probability that you are chosen first to audition and your friend Petra is chosen second.

① ${}^8P_2 = 56$ ② probability $\frac{1}{56}$

$\frac{1}{56}$

SECTION 13.3

You can choose 3 toppings for a pizza out of 14 for no extra charge. How many combinations of pizza toppings are possible?

$$14C_3 = \frac{14!}{(14-3)! 3!} = \boxed{364}$$

Evaluate.

$$9C_4 = \frac{9!}{(9-4)! 4!} = \boxed{126}$$

$$11C_6 = \frac{11!}{(11-6)! 6!} = \boxed{462}$$

Two out of 10 flag twirlers are randomly chosen to lead the flag twirlers in a school parade. What is the probability that the two flag twirlers are you and your sister?

① $10C_2 = \boxed{45}$
↑
number of comb. of 2 out of 10

② probability you are one of those comb.?
 $\boxed{\frac{1}{45}}$

SECTION 13.4

A bag contains 5 yellow marbles, 4 blue marbles, and 3 red marbles. You randomly draw two marbles, one at a time. Find the probability that both are blue if... Total: 12

You replace the first marble

$$\frac{4}{12} \cdot \frac{4}{12} = \frac{16}{144} = \boxed{\frac{1}{9}}$$

You do not replace the first marble

$$\frac{4}{12} \cdot \frac{3}{11} = \frac{12}{132} = \boxed{\frac{1}{11}}$$

A survey of 100 students at your school found that 58 students ride the bus, 22 drive to school, 14 walk, and 6 get a ride from a relative. If one of the students surveyed is chosen at random, what is the probability the student either drives to school or walks?

$$\frac{22}{100} + \frac{14}{100} = \frac{36}{100} = \boxed{\frac{9}{25}}$$

You roll a number cube. Tell whether the events A and B are mutually exclusive or overlapping. Then find the probability of it happening.

Event A: Roll a 5. 5

Event B: Roll a prime number. 3, 5

overlapping
 $\frac{1}{6} + \frac{2}{6} - \frac{1}{6} = \frac{2}{6} = \boxed{\frac{1}{3}}$

Event A: Roll a 4. 4

Event B: Roll a multiple of 3. 3, 6

prime
 $\frac{1}{6} + \frac{2}{6} = \frac{3}{6} = \boxed{\frac{1}{2}}$

mutually exclusive