

Name: Key

Class: _____

Date: _____

ID: A

Honors Algebra 3-4 Review 11.1 - 11.4

Mrs. Severson

1. A yogurt shop offers 7 different flavors of frozen yogurt and 10 different toppings. How many choices are possible for a single serving of frozen yogurt with one topping?

$7 \cdot 10 = 70$ options

2. In how many different orders can you line up 7 players from the Cubs?

$7! = 5040$ ways

3. Verne has 8 math books to line up on a shelf. Jenny has 4 English books to line up on a shelf. In *how many more orders* can Verne line up his books than Jenny?

Verne: $8!$ Jenny: $4!$ $8! - 4! = 40320 - 24 = 40296$

4. In how many ways can 11 basketball players be listed in a program?

$11! = 39916800$ ways

5. There are 5 students participating in a spelling bee. In how many ways can the students who go first, second, and third in the bee be chosen?

$5 \cdot 4 \cdot 3 = 60$ ways

6. The Booster Club sells meals at basketball games. Each meal comes with a choice of hamburgers, pizza, hot dogs, cheeseburgers, or tacos, and a choice of root beer, lemonade, milk, coffee, tea, or cola. How many possible meal combinations are there?

$5 \cdot 6 = 30$ options
FOOD BEVERAGE

7. In how many ways can 7 singers be selected from 9 who came to an audition?

$9C_7$ order doesn't matter! 36

8. A bag contains 6 red marbles, 5 white marbles, and 4 blue marbles. Find $P(\text{red or blue})$.

Total: $6 + 5 + 4 \rightarrow 15$ $P(\text{red or blue}) = \frac{10}{15} = \frac{2}{3}$ or 66.7%

9. A bag contains 6 red marbles, 4 white marbles, and 6 blue marbles. Find $P(\text{red and blue})$.

0 Can't happen!

10. Teesha is in the French club. There are 36 students in the club. The French teacher will pick two students at random to guide visiting students from France. What is the probability that Teesha will not be picked as a guide?

$P(\text{not going}) = 1 - P(\text{going})$
 $1 - \frac{1}{18} = \frac{17}{18}$
 $P(\text{Teesha picked to go to France}) = \frac{2}{36} \rightarrow \frac{1}{18}$

11. So far this season, Jake Arrieta of the Chicago Cubs has 55 strikeouts in 56 innings pitched. What is the probability that he will strikeout a batter in the next inning? Round your answer to 3 decimals.

$P(s.o) = \frac{55}{56} = .982$

12. Two dice numbered from 1 through 6 with each number equally likely to occur are tossed.

a) Draw the sample space for the sum of the two dice.

(Sum)	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

b) What is the probability of obtaining a sum less than 4?

$$\frac{3}{36} \rightarrow \boxed{\frac{1}{12}}$$

c) What is the probability of obtaining a sum greater than 7?

$$\frac{5+4+3+2+1}{36} \rightarrow \frac{15}{36}$$

d) What is the probability of obtaining a sum equal to 5?

$$\frac{4}{36} \rightarrow \boxed{\frac{1}{9}}$$

13. Six people each flip a coin one time. Find each theoretical probability. Show how you arrived at your answer.

a) P(6 heads)

$$\frac{1}{2^6} \qquad \frac{1}{64}$$

b) P(exactly 4 heads)

$$\frac{{}^6C_4}{64} \Rightarrow \frac{15}{64}$$

c) P(at least 5 tails)

$$\frac{{}^6C_5 + {}^6C_6}{64} = \frac{6+1}{64} = \frac{7}{64}$$

d) P(less than 3 tails)

$$\frac{{}^6C_2 + {}^6C_1 + {}^6C_0}{64} = \frac{15+6+1}{64} = \frac{22}{64} \text{ or } \frac{11}{32}$$

14. Suppose Q and R are independent events. Find P(Q and R).

P(Q) = 0.39, P(R) = 0.85

$$P(Q \text{ and } R) = .39(.85) = .3315$$

$$\frac{11}{32}$$

Suppose S and T are mutually exclusive events. Find P(S or T).

15. P(S) = 26%, P(T) = 44%

$$26\% + 44\%$$

$$70\%$$

$$P(\text{green}) + P(\text{cube}) - P(\text{green and cube})$$

16. A jar contains 7 blue cubes, 3 blue spheres, 2 green cubes, and 6 green spheres. If you select an object at random, what is the probability that the object is green or a cube?

$$\frac{15}{18} \text{ or } \frac{5}{6}$$

Total = 7 + 3 + 2 + 6 = 18 objects

$$P(\text{green}) = \frac{8}{18} \quad P(\text{cube}) = \frac{9}{18}$$

17. Joey's sock drawer is unorganized and contains 7 black dress socks, 7 black ankle socks, 6 brown dress socks, and 2 brown ankle socks. What is the probability that Joey will blindly reach into his sock drawer and pull out a sock that is brown or a dress sock?

$$P(\text{brown}) = \frac{8}{22}$$

$$P(\text{dress sock}) = \frac{13}{22}$$

$$P(\text{brown dress sock}) = \frac{6}{22}$$

$$\frac{8}{22} + \frac{13}{22} - \frac{6}{22} = \frac{15}{22}$$

18. The contingency table shows the results of a survey of college students. Find the probability that a student's first class of the day is a humanities class, given the student is male. Round to the nearest thousandth.

First Class of the Day for College Students

	Male	Female
Humanities	70	80
Science	50	80
Other	60	70

$$P(\text{Humanities} | \text{male}) = \frac{70}{180} = \frac{7}{18}$$

19. The probability that a city bus is ready for service when needed is 77%. The probability that a city bus is ready for service and has a working radio is 74%. Find the probability that a bus chosen at random has a working radio given that it is ready for service. Round to the nearest tenth of a percent.

a. 3.0%

b. 10.4%

c. 100.9%

d. 96.1%

$$P(\text{ready}) = .77$$

$$P(\text{ready \& working radio}) = .74$$

$$P(\text{bus ready} | \text{w/working radio}) = \frac{.74}{.77}$$

use Formula:

$$P(B|A) = \frac{P(A \text{ and } B)}{P(A)}$$

$$P(\text{like art}) = .36$$

$$P(\text{like art AND science}) = .21$$

$$P(\text{like science} / \text{like art}) = ?$$

use formula

$$P(B|A) = \frac{P(A \text{ and } B)}{P(A)}$$

$$P(\text{like science} / \text{like art}) = \frac{.21}{.36}$$

B

20. The probability that a student at certain high school likes art is 36%. The probability that a student who likes art also likes science is 21%. Find the probability that a student chosen at random likes science given that he or she likes art. Round to the nearest tenth of a percent.

a. 15.0%

b. 58.3%

c. 61.3%

d. 17.1%

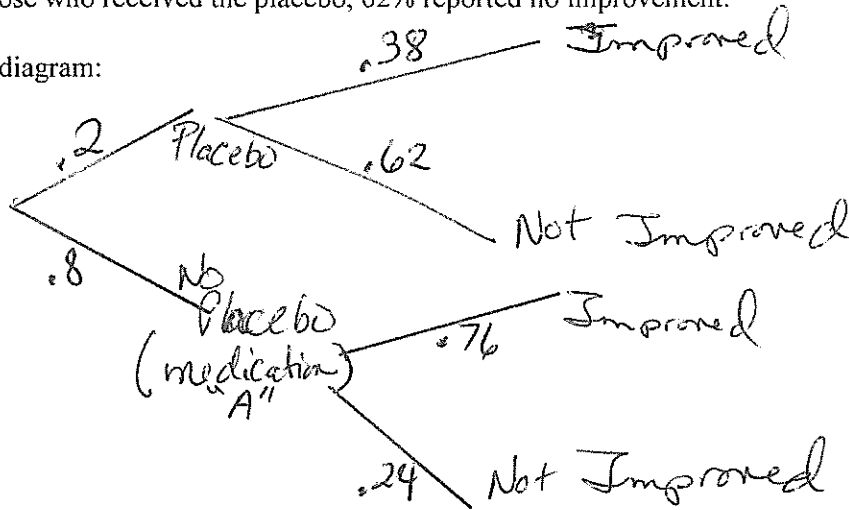
21. Participants in a study of a new medication received either medication A or a placebo. Make a tree diagram of the results of the study. Then find $P(\text{placebo and improvement})$.

Of all those who participated in the study, 80% received medication A.

Of those who received medication A, 76% reported an improvement.

Of those who received the placebo, 62% reported no improvement.

Tree diagram:



$P(\text{placebo and improvement}) = .2(.38) = .076$ OR 7.6%

22. An airline has 90% of its flights depart on schedule. It has 71% of its flights depart and arrive on schedule. Find the probability that a flight that departs on schedule also arrives on schedule.

a. 0.39

b. 0.79

c. 0.09

d. 1.49

23. On St. Patrick's Day, you took note of who was coming into your restaurant wearing green. What is the probability that someone was wearing green given that the customer is female?

	Wearing Green	Not Wearing Green
Male	56	70
Female	29	83

Total
126
112

$$P(\text{green} / \text{female}) = \frac{29}{112}$$