

REVIEW PROBABILITY DISTRICT TEST

1.) How does understanding probability and statistics affect decision making?

It can be used to make informed decisions in our lives by showing us that an event is more or less likely.

2.) Why is the classification of events important?

It has an impact on probability.

Event can be classified as:

- Compound
- Independent
- Dependent

3.) How can we compare data from different groups?

Data can be organized for easier analysis.

Examples are:

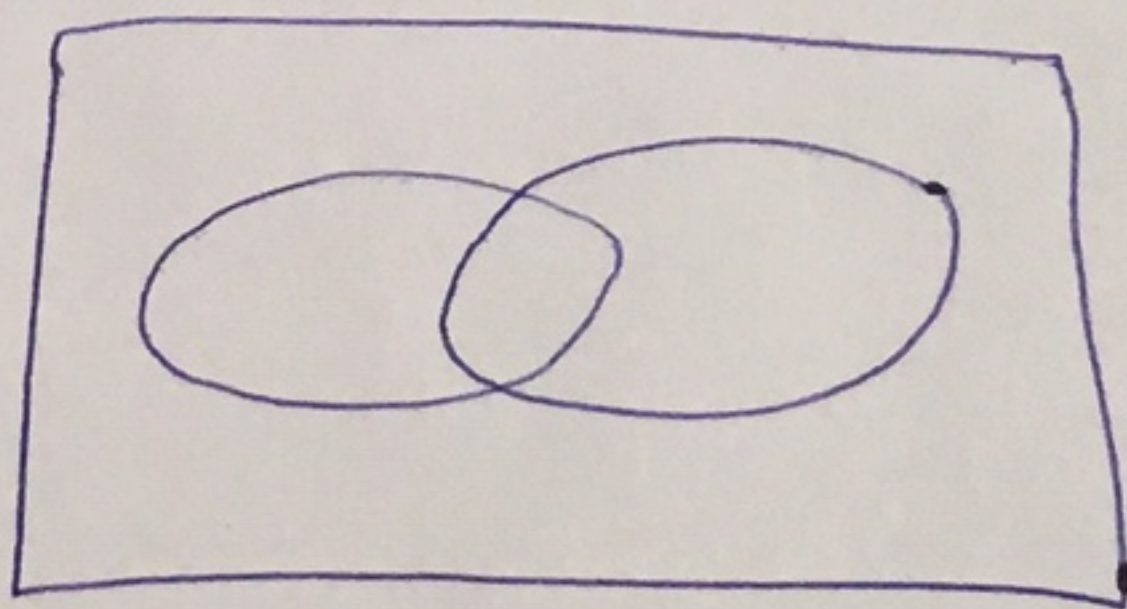
- Sets
- Two-way frequency tables
- Venn-diagrams

4.)^{a)} Create a Venn-diagram

$$A = \{1, 4, 7, 10\}$$

$$B = \{2, 5, 8, 10\}$$

$$U = \{3, 6, 9, 1-10\}$$



b) $P(A \cap B)$

$$\frac{2}{10}$$

c) $P(A \cup B)$

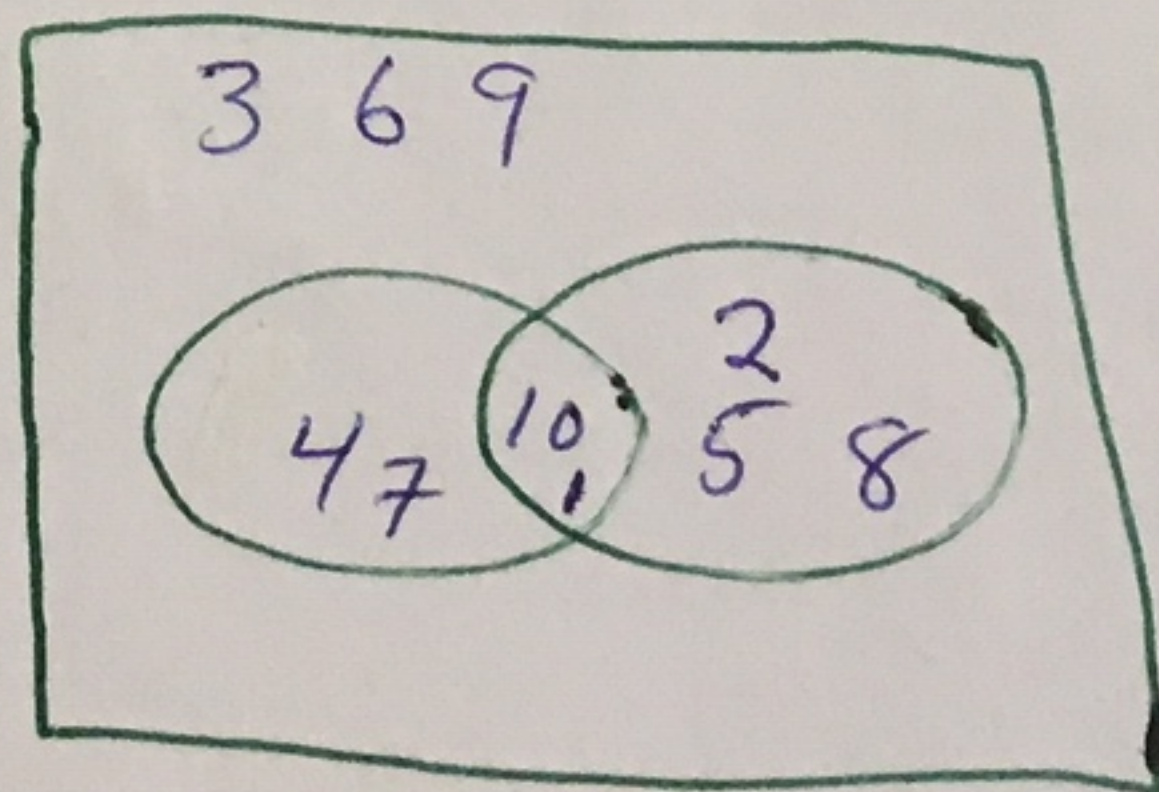
$$\frac{7}{10}$$

d) $P(B)$

$$\frac{5}{10}$$

e) $P(A^c)$

$$\frac{6}{10}$$



5.) a) How many ways can 4 people be chosen from a group of 10 to the student committee?

same job so: ${}_{10}C_4 = \frac{10!}{4!6!} = \frac{10 \cdot 9 \cdot 8 \cdot 7}{4 \cdot 3 \cdot 2 \cdot 1} = \frac{5040}{24} = 210$

$$\frac{n!}{r!(n-r)!}$$

b) what's the probability that Pete, Jessica, Amy and Brad will all be chosen?

$${}_4C_4 = \frac{4!}{4!0!} = \frac{4!}{4!} = \frac{4 \cdot 3 \cdot 2 \cdot 1}{4 \cdot 3 \cdot 2 \cdot 1} = 1$$

so $\frac{1}{210}$

6.) a) How many ways can 4 people be chosen from a group of 10 to be President, Vice President, Secretary and Treasurer?

Different jobs so: ${}_{10}P_4 = \frac{10!}{6!} = 10 \cdot 9 \cdot 8 \cdot 7 = 5040$

$$\frac{n!}{(n-r)!}$$

b) what's the chance that Pete will be president, Jessica Vice President, Amy secretary and Brad Treasurer?

only one way this can happen

so $\frac{1}{5040}$.

7.) a) Make your own two-way frequency table:

80 people, 50 men and 30 women, were asked if prefer to watch sport or movies on TV.
30 men said they prefer Sport. 18 women prefer movies.

Determine if events M and S are independent or dependent.

	Sport	Movies	Total
M	30	20	50
W	12	18	30
Total	42	38	80

b) $P(S)$

$$\frac{42}{80}$$

d) $P(M)$

$$\frac{50}{80}$$

e) $P(M \cap S)$

$$\frac{30}{80}$$

f) If independent:

$$P(S) \cdot P(M) = P(M \cap S)$$

$$\frac{42}{80} \cdot \frac{50}{80} = \frac{30}{80} ?$$

$$\frac{2100}{6400} = \frac{30}{80} ?$$

$$0.328 \neq 0.375$$

So dependent

8.)

	C	Not C	Total
D	12	16	28
Not D	11	21	32
Total	23	37	60

a) $P(D)$ (Reduce if possible)

$$\frac{28}{60} = \frac{14}{30} = \frac{7}{15}$$

b) $P(\text{not } C)$

$$\frac{37}{60}$$

c) $P(\text{not } D \cap C)$

$$60 - 12 \rightarrow \frac{48}{60}$$

badly written!

d) $P(D|C)$

$$\frac{12}{23}$$

9.) A jar contains 4 blue, 6 red and 8 green marbles. (So 18 in total)

a) Amanda selects a marble and keeps it. Then she selects another one.

 $P(\text{red, then green})?$

$$\frac{6}{18} \cdot \frac{8}{17} = \frac{48}{306} = 0.1568 = 15.7\%$$

EX.

$$\begin{array}{r} 18 \\ \cdot 175 \\ \hline 126 \\ + 18 \\ \hline 306 \end{array}$$