

Evaluate and show the set up.

1.  ${}_7P_3 = \frac{7!}{(7-3)!} = 210$

2.  ${}_7P_5 = \frac{7!}{(7-5)!} = 2520$

3.  ${}_7C_2 = \frac{7!}{(7-2)!2!} = 21$

4. The company Sea Esta has ten members on its board of directors. In how many different ways can it elect a president, vice president, secretary and treasurer?  ${}_{10}P_4 = 5040$  or  $\frac{10 \cdot 9 \cdot 8 \cdot 7}{\text{pres VP Sec Treas}} = 5040$

5. In the Long Beach Air Race six planes are entered and there are no ties, in how many ways can the first three finishers come in?  ${}_6P_3 = 120$  or  $\frac{6 \cdot 5 \cdot 4}{1^{\text{st}} 2^{\text{nd}} 3^{\text{rd}}} = 120$

6. A four person committee is to be elected from an organization's membership of 11 people. How many different committees are possible?  ${}_{11}C_4 = 330$

7. There are 12 standbys who hope to get on your flight to Hawaii, but only 6 seats are available on the plane. How many different ways can the 6 people be selected?  ${}_{12}C_6 = 924$

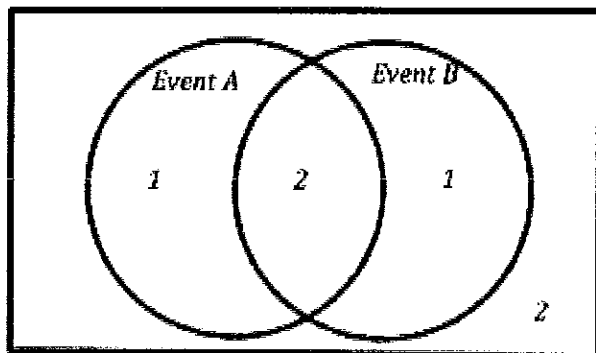
8. The model car you are thinking of buying is available in nine different colors and three different styles. In how many ways can you order the car?  $9 \cdot 3 = 27$

9. A book club offers a choice of 8 books from a list of 40. In how many ways can a member make a collection?  ${}_{40}C_8 = 76,904,685$

10. Suppose you find seven articles related to the topic of your research paper. In how many ways can you choose 5 articles to read?

11.

${}_7C_5 = 21$



a. How many total outcomes are possible?

b.  $P(A) = \frac{3}{6} = \frac{1}{2}$

c.  $P(B) = \frac{3}{6} = \frac{1}{2}$

d.  $P(A \cap B) = \frac{2}{6} = \frac{1}{3}$

e.  $P(A|B) = \frac{2}{3}$

Given the data collected from 200 individuals concerning whether or not to extend the length of the school year in the table below answer the questions.

	For	Against	No Opinion	
Youth (5 to 19)	7	35	12	54
Adults (20 to 55)	30	27	20	77
Seniors (55 +)	25	16	28	69
	62	78	60	200

12.

13. Given that condition that a person is an adult what is the probability that they are in favor of extending the school year?  $P(\text{For}|\text{Adult}) =$

$$\frac{30}{77}$$

14. Given the condition that a person is against extending the school year what is the probability they are a Senior?  $P(\text{Senior}|\text{Against}) =$

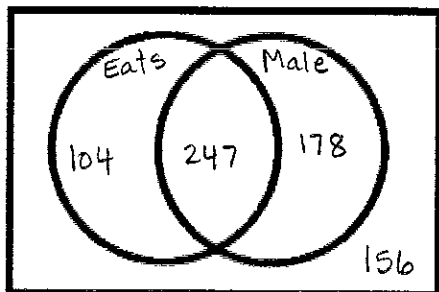
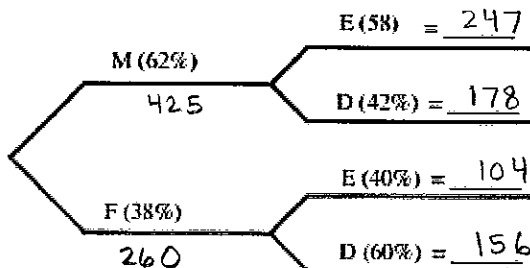
$$\frac{16}{78}$$

15. What is the probability that a person has no opinion given that they are a youth?

$P(\text{no opinion}|\text{youth}) =$

$$\frac{12}{54}$$

16. The most important meal of the day.

Notation	2-way Table																
<p>Key:  Male = M                  Female = F  Eats Breakfast = E    Doesn't Eat Breakfast = D</p> <p>Sample size = 685</p> <p><math>P(E) = \frac{351}{685}</math>                  <math>P(E M) = \frac{247}{425}</math></p> <p><math>P(E \cap M) = \frac{247}{685}</math>                  <math>P(E F) = \frac{104}{260}</math></p> <p><math>P(E \cap F) = \frac{104}{685}</math></p>	<table border="1"> <thead> <tr> <th></th> <th>Eats</th> <th>Doesn't</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Male</td> <td>247</td> <td>178</td> <td>425</td> </tr> <tr> <td>Female</td> <td>104</td> <td>156</td> <td>260</td> </tr> <tr> <td>Total</td> <td>351</td> <td>334</td> <td>685</td> </tr> </tbody> </table>		Eats	Doesn't	Total	Male	247	178	425	Female	104	156	260	Total	351	334	685
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Venn Diagram	Tree Diagram																
																	

17. What is the probability of selecting a King from a deck of cards followed by a 10?

with replacement

without replacement

$$\left(\frac{4}{52}\right)\left(\frac{4}{52}\right) = .0059$$

$$\frac{4}{52} \cdot \frac{4}{51} = .006$$

18. Two cards are selected from a deck of cards. First a red card is chosen and without replacement a queen is chosen. What is the probability?

$$\left(\frac{1}{2}\right)\left(\frac{4}{51}\right) = .0392$$

19. Three numbers are chosen from cards numbered 1-10. First a three is chosen and without replacement a two is chosen and not replaced and then a 10 is chosen. What is the probability?

$$\left(\frac{1}{10}\right)\left(\frac{1}{9}\right)\left(\frac{1}{8}\right) = .00138$$

20. What is the probability of flipping a coin and getting heads three times in a row?

$$\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{8} = .125$$

The following data represents the number of men and women passengers aboard the titanic and whether or not they survived.

21.

	Survived	Did not survive	Total
Men	146	659	805
Women	296	106	402
Total	442	765	1207

$$P(w) = \frac{402}{1207}$$

$$P(s) = \frac{442}{1207}$$

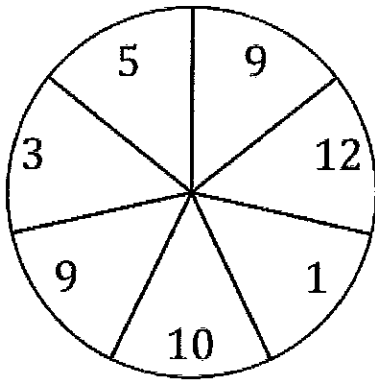
$$P(s|w) = \frac{296}{402}$$

$$P(w \text{ or } s) = \frac{402}{1207} + \frac{442}{1207} - \frac{296}{1207} = \frac{548}{1207}$$

$$P(A) + P(B) - P(A \text{ and } B) \quad \text{over lap}$$

$$P(w \text{ or } m) = \frac{402}{1207} + \frac{805}{1207} = \frac{1207}{1207} = 1$$

22. Calculate the probability of each spin.



$$P(\geq 2) = \frac{6}{7}$$

$$P(\leq 3) = \frac{2}{7}$$

$$P(\leq 4) = \frac{2}{7}$$

$$P(3) = \frac{1}{7}$$

$$P(\geq 6) = \frac{4}{7}$$

$$P(\geq 7) = \frac{4}{7}$$

23. Calculate:

$$5! = 120$$

$$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

$$3! = 6$$

$$3 \cdot 2 \cdot 1 = 6$$

$$\frac{7!}{3!2!} = \frac{7 \cdot 6 \cdot 5 \cdot \cancel{4} \cdot \cancel{3}!}{\cancel{3}! \cdot 2!} = 420$$

24. On a die numbered 1-6, what is the probability of not getting a 3?

$$\frac{5}{6}$$

What is the probability of getting a 7?

$$0$$

25. The table shows patient data for red-green color blindness in one doctor's office.

M: means male      M': means not male  
C: means color blind      C': means not color blind

	M	M'	Total
C	42	4	46
C'	363	591	954
Total	405	595	1000

Find the following probabilities:

a)  $P(C) = \frac{46}{1000}$

b)  $P(M' \cap C') = \frac{591}{1000}$

c)  $P(M|C') = \frac{363}{954}$

Draw a Venn diagram to represent the given data.

