PLEASE SUBMIT ALL SECTIONS OF THIS HOMEWORK AT ONCE!

Homework 11-1: Complete your assignment on a separate sheet of paper. Show all work.

1. You have five shirts and four pairs of pants. How many different ways can you arrange your shirts and pants into outfits?
2. To create a passcode, you need to first choose a letter and then, three single-digit numbers. How many different passcodes can you create?
3. Evaluate

a. 10! b. 6P3 c. 7C5

4. How many different nine-player batting orders can be chosen from a baseball team of 16?
5. Explain the difference between permutations and combinations.

Homework 11-2: Complete your assignment on a separate sheet of paper. Show all work.

1. What is the probability a quarterback will complete his next pass if he has completed 30 of his last 40 passes?
2. A group of five cards are numbered 1-5. You choose one card at random. Find each theoretical probability.

a. P (card is 2) b. P(even number) c. P(less than 5)

3. Explain the difference between experimental probability and theoretical probability.

Homework 11-3: Complete your assignment on a separate sheet of paper. Show all work.

1. A and B are independent events. Find P(A and B).

a. P(A) = 16, P(B) = 25 b. P(A) = 920, P(B) = 34

2. C and D are mutually exclusive events. Find P(C or D).

a. P(C) = 25, P(D) = 35 b. P(C) = 12, P(D) = 38

3. Events A and B are not mutually exclusive. If P(A) = 12, P(B) = 14 and P(A and B) = 18, Find P(A or B).
4. Explain the difference between mutually exclusive events and independent events.
5. The weather forecast for the weekend is a 30% chance of rain on Saturday and a 70% chance of rain on Sunday. Your friend says that means there is a 100% chance of rain this weekend. What error did your friend make?

Homework 11-4: Complete your assignment on a separate sheet of paper. Show all work.

1. A card is drawn from a standard deck of cards. Find each probability, given that the card drawn is black.

a. P(club) b. P (4) c. P(diamond)

2. The probability that a car has two doors, given that it is red is 0.6. The probability that a car has two doors and is red is 0.2. What is the probability that a car is red?
3. Use the table to find each probability.

a. P (male graduate)
b. P (the degree is a BS)
c. P (The graduate is female, given the degree is an AAS)

	Male	*Female*
AAS degree	245	433
BS degree	598	858

Homework 11-5 thru 11-9: Complete your assignment on a separate sheet of paper. Show all work.

1. Find the mean, median, mode, range, minimum, maximum, interquartile range and standard deviation of the data. Then create a box & whisker plot. Are there any outliers?

   Data: 90, 100, 110, 40, 98, 102, 112, 90, 92

2. To investigate a community's reading habits, a newspaper conducts a poll from a table near the exit of a history museum. What is the sampling method used and does the method have any bias? Explain.
3. A survey asks, "Aren't handmade gifts always better than tacky purchased gifts?" Does this survey question have any bias? Explain and give the question type.
4. A set of data has a normal distribution with a mean of 50 and a standard deviation of 8. Sketch a normal distribution curve and determine the percent of data within each interval. a. from 42 to 58 b. greater than 34 c. less than 50

HOMEWORK 11-1

1) $\underset{\text{shirts}}{5} \cdot \underset{\text{pants}}{4} = 20$ ways

2) $\underset{\text{letter}}{26} \cdot \underset{\text{number}}{10} \cdot \underset{\text{number}}{10} \cdot \underset{\text{number}}{10} = 26 \cdot 1000 = 26{,}000$ passcodes

3) Evaluate

a) $10! = 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 3{,}628{,}800$

or calculator (MENU 1, OPTN, F6, F3(PROB), F1)

b) ${}_6P_3 = 120$ (calculator, MENU 1, OPTN, F6, F3, F2)

or by hand $\frac{6!}{3!} = \frac{6 \cdot 5 \cdot 4 \cdot \cancel{3 \cdot 2 \cdot 1}}{\cancel{3 \cdot 2 \cdot 1}} = 120$

c) ${}_7C_5 = 21$ or by hand $\frac{7!}{5!\,2!} = \frac{7 \cdot \overset{3}{\cancel{6}} \cdot 5 \cdot \cancel{4 \cdot 3 \cdot 2 \cdot 1}}{\cancel{2 \cdot 1} \quad \cancel{5!}}$

$= \boxed{21}$

4) different nine-player batting orders!

order matters - PERMUTATION ${}_{16}P_9 =$

$\boxed{4{,}151{,}347{,}200}$

5) In permutation order matters, in combination it does not.

HOMEWORK 11-2

1) $\frac{\text{PART}}{\text{whole}} = \frac{30}{40} = \boxed{\frac{3}{4} \text{ or } 0.75 \text{ or } 75\%}$

2)
a) $P(\text{card is } 2) = \frac{1}{5}$ (just one card is 2)

b) $P(\text{even number}) = \frac{2}{5}$ (two cards are even 2 and 4)

c) $P(\text{less than } 5) = \frac{4}{5}$ (four cards are less than 5) 1, 2, 3, 4

3) Experimental probability is the number of succesful trials divided by number of all trials.

theoretical probability is the number of times an event can occur out of all possible outcomes.

HOMEWORK 11-3

1) a) $P(A) = 16\%$ $P(B) = 25\%$

$P(A \text{ and } B) = 0.16 \cdot 0.25 = 0.04 = \boxed{4\%}$

b) $P(A) = 920\%$ $P(B) = 34\%$

$P(A \text{ and } B) = 9.2 \cdot 0.34 = 3.128 = \boxed{312.8\%}$

2) a) $P(C) = 25\%$ $P(D) = 35\%$

$P(C \text{ or } D) = 25\% + 35\% = \boxed{60\%}$

b) $P(C) = 12\%$ $P(D) = 38\%$

$P(C \text{ or } D) = 12\% + 38\% = \boxed{50\%}$

3) <u>not</u> mutually exclusive (means they happen at the same time)

$P(A) = 12\%$ $P(B) = 14\%$ $P(A \text{ and } B) = 18\%$

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$12\% + 14\% - 18\% = 26\% - 18\%$

$= \boxed{8\%}$

4) Mutually exclusive: cannot happen at the same time

independent: the second event is not affected by the first

5) Friend added instead of multiplying.

Chance of rain for the weekend means Sat <u>and</u> Sun!

$0.3 \cdot 0.7 = 0.21 = \boxed{21\%}$

HOMEWORK 11-4

1) given that the card is black

TOTAL black cards: $13+13=26$

a) $P(\text{club}) = \frac{13}{} = \frac{1}{2}$ (13 club cards)

b) $P(4) = \frac{2}{26} = \frac{1}{13}$ (two 4's that are black)

c) $P(\text{diamond}) = \frac{0}{26}$ (diamonds are red!)

$= 0$

2) $P(2 \text{ doors} \mid \text{red}) = 0.6$

$P(2 \text{ doors and red}) = 0.2$

$$P(2 \text{ doors} \mid \text{red}) = \frac{P(2 \text{ doors and red})}{P(\text{red})}$$

$$0.6 = \frac{0.2}{P(\text{red})}$$

$$P(\text{red}) = \frac{0.2}{0.6} = \boxed{\frac{1}{3}}$$

3) a) $P(\text{male graduate}) = \frac{245+598}{\text{All}} = \frac{843}{2134}$

$= \boxed{0.395}$

b) $P(\text{the degree is a BS}) = \frac{598+858}{\text{All}} = \frac{1456}{2134} = \boxed{0.682}$

c) $P(\text{FEMALE} \mid \text{AAS}) = \frac{433}{245+433} = \boxed{0.639}$

HOMEWORK 11-5

1) MENU 2, ENTer data, F2, F1

mean: 92.67

median (Q2): 98

mode: 90

Q1: 90

Q3: 106

range: MAX − MIN

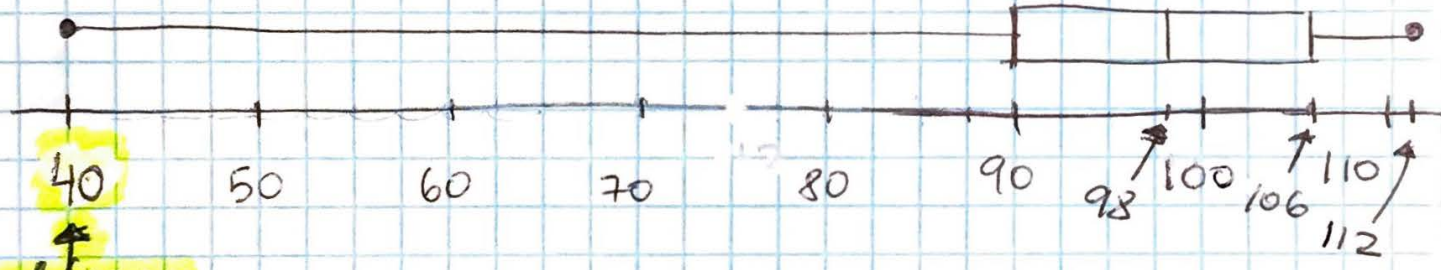
112 −

=

interquartile range: Q3 − Q1

106 − 90

= 16



outlier

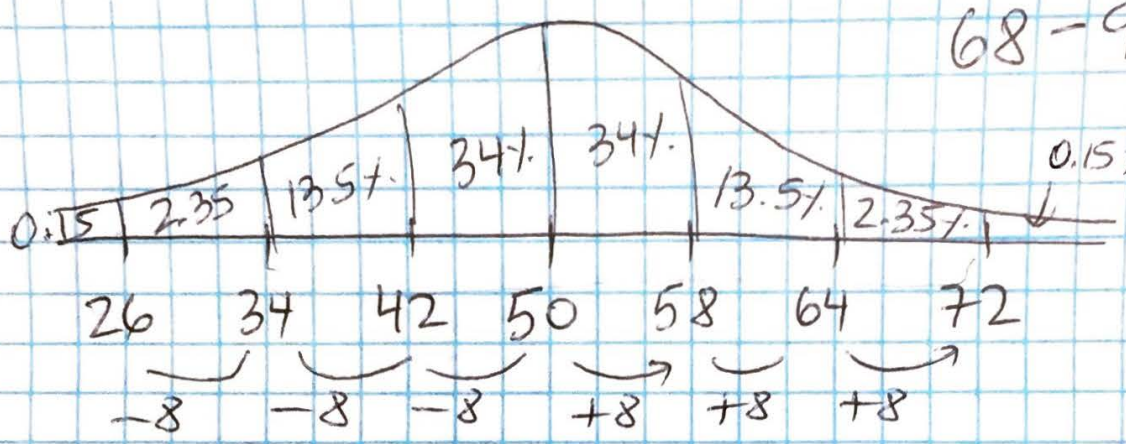
2) sampling method: convenience

bias: Yes, the people who visit the history museum are more likely to like to read, thus the data would not be a good representative of the population.

3) YES, LEADING question (aren't they better?)

68-95-99.7

4)



a) from 42 to 58 = 68%

b) greater than 34 = 95% + 2.5% = 97.5%

or 100% - 2.35% - 0.15% = 97.5%

c) less than 50 = 50%