:

1) If the probability of rolling a 1 on a dice is (.17) and obtaining a heart when picking card from a deck is (.25), what is the probability of someone rolling a 1 and picking a heart from the deck if these events are independent from one another?

$P(X \text{ and } Y) = P(X) \cdot P(Y)$

$= (.17)(.25)$

$= .0425$

2) If the person rolled two dice and was looking to get a 1 on the first roll and a 1 on the second roll, and obtained a probability of (.05), were the events independent?

$P(1) \cdot P(1) = P(1 \text{ and } 1)$

$\frac{1}{6} \cdot \frac{1}{6} = .028 \neq .05$

$\therefore$ not independent.

3) Taxi drivers post the estimated arrival times for all of their drives. However, sometimes they arrive later than expected. The following data reports the number of taxis that were "on time" or "late" for two different companies for all drives in NYC, Miami, and Buffalo.

	NYC		Miami		Buffalo	
	On Time	Late	On Time	Late	On Time	Late
Taxi A	4,564	9.210	3,212	476	985	23
Taxi B	809	64	6,923	2,045	3,270	611

a. Use the data to estimate the probability that a randomly selected Taxi drive in Buffalo will be on time.

please

Consider only the taxis of NYC and Buffalo:

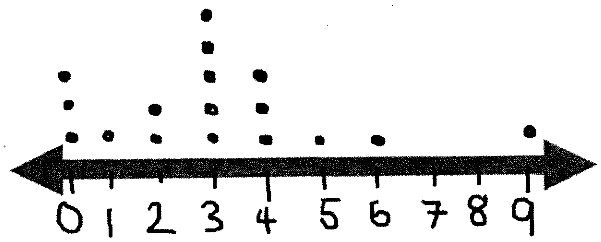
b. Explain what it means to say that the events "arriving late" and "Buffalo" are independent.

ignore

c. Do the events "arriving late" and "Buffalo" appear to be approximately independent? Explain you answer.

these questions.
Poorly worded.

4) The data below shows the result of how many text messages a student says they send in an hour on average.



a. What are the mean, standard deviation, and margin of error?

$\bar{X} = 3.06$ SD $= 2.2$ MOE $= 2(2.2)$

σX $= 4.4$

b. How could someone get a more reliable data?

By increasing the sample size

The Buffalo Bills have a game on Sunday. They win 65% of their games. There is a 30% chance of snow during Sunday's game. If the probability that it snows given that the Bills win is 30%. It can be concluded that these two events are **5)**

(1) Complements

(2) Dependent

(3) Independent

(4) Mutually exclusive

	S	NS	
W	x		65
L			35
	30	70	100

$\frac{x}{65} = .3$

$\frac{30}{100} = .3$

6) On the New York State Math 8 Exam the mean is 73 and the standard deviation is 7. If the data is normally distributed, approximately what percent of the scores fall between 66 and 80?

(1) 16%

(2) 34%

(3) 68%

(4) 95%

normalcdf(73, 7, 66, 80)

7) Four surveys are described below. Which survey methodology would lead to the *least* biased conclusion?

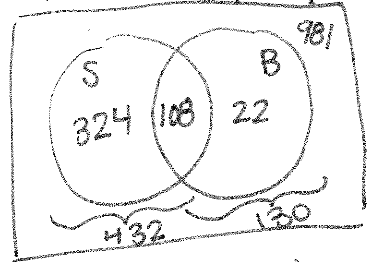
(1) One hundred randomly chosen heart surgeons were polled by telephone about how to get children to eat healthier foods.

(2) A country and western radio station asked one hundred to its listeners to call a telephone number and answer a question about rap music.

(3) From calls made to one hundred randomly generated telephone numbers, people replied to a question about television shows they watch.

(4) The first one hundred people who left the World of Baseball Bookstore replied to a question about the important of baseball to society.

8) Hilton High School has a population of 1435 students. The number of students who participate in fall sports is 432. The number of students who participate in band (including Jazz band) is 130. If the probability that a student participates in either a fall sport or band is $\frac{454}{1435}$, what is the probability that a student participates in both a fall sport and band?



S = Sports
B = Band

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

$= \frac{432}{1435} + \frac{130}{1435} - \frac{454}{1435} \rightarrow P(S \text{ and } B) = \frac{108}{1435}$

9) The probability of Coach Lipini changing his seat during a basketball game is 0.90. The probability of Joey Lipani getting over 16 minutes of play time in a basketball game is 0.75. The probability of Coach lipani changing his seat and Joey playing over 16 minutes is .675. It can be concluded that the two events are?

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

$.675 = (.9)(.75)$

$.675 = .675$ ✓

$\frac{.675}{.75} = .9$

$.9 = .9$

$\frac{.9}{1}$

1) Independent
2) Dependent
3) Mutually Exclusive
4) Complements

	Move	No Move	
16+	.675		.75
u16			.25
	.9	.1	1

10) The probability of Ms. Lang coming to my review class is .40 and the probability of Mr. Sedia coming to the review class is .34. The probability of Ms. Lang coming to review given that Mr. Sedia has come is .85. It can be concluded that the two events are?

1) Independent
2) Dependent

3) Mutually Exclusive
4) Complements

	L R	L NR	
S R	x		.34
S NR			
	.4	.6	1

$\frac{x}{.34} = .85$

$\frac{.4}{1} = .4$

not equal

11) Given Events **S** and **M**, such that the $P(S) = .33, P(M) = .61$ *and* $P(S \cup M) = .94$, determine if the Events S and M are independent or dependent.

or

indep. if... $P(S \text{ and } M) = P(S)P(M)$

Not independent

$P(S \text{ and } m) = P(S) + P(M) - P(S \text{ or } m)$

$= .33 + .61 - .94$

$P(S \text{ and } m) = 0$

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

$0 = .33 \cdot .61$?

$0 \neq .2013$

12) The math department had to report out to board of education about students enrolled in higher level math course. The report indicated that 18.4% of the senior class were enrolled in AP Calculus, 12.4% of the senior class was enrolled in AP Statistics and 3.6% of them were enrolled in both.
Find the probability, to the nearest *hundredths* place, that a student is enrolled in AP Calculus given they are enrolled in AP Statistics.

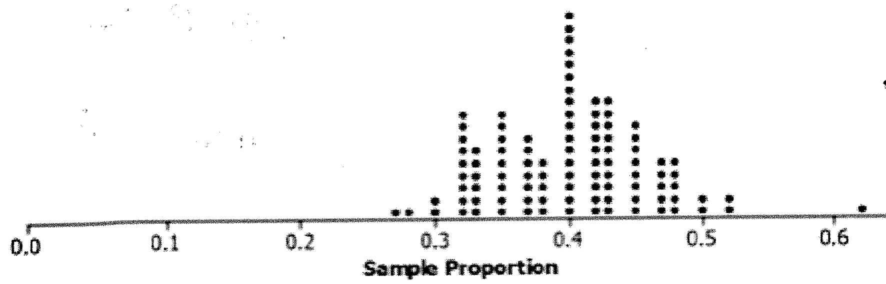
	AP Calc		
APStat	$\boxed{.036}$		.124
	.184		1

$\rightarrow \frac{.036}{.124} = \boxed{.29}$

given

13) A survey of 300 randomly selected members of a fitness club were asked if they use the fitness club as much as they would like to. The staff then conducted a simulation of 50 more polls of 150 members, assuming that 40% of members are using the club as much as they would like to. The output of the simulation is shown in the diagram below.

$\hat{p}$



$2\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Given this output, and assuming 95% confidence level, the margin of error for the poll is closest to

(1) 0.05

0.06

(3) 0.08

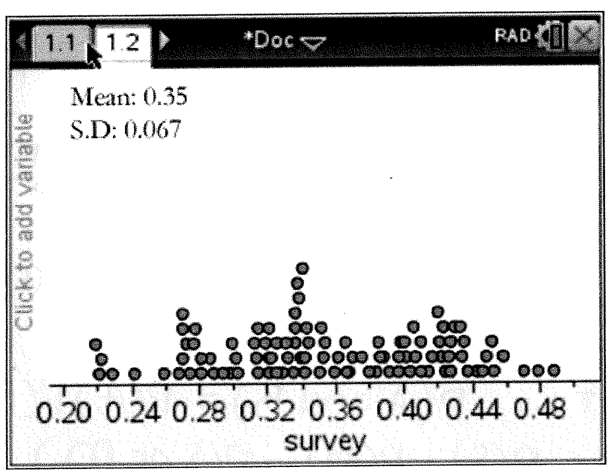
(4) 0.139

$\hat{p} = .4$

$MOE = 2\sqrt{\frac{.4(.6)}{150}}$

$= .08$

14) Fitness Blender, an online exercise channel, is considering whether to create a new 8 week workout challenge. The owners will launch a new program if at least 35% of its users will purchase the program. Fifty users are randomly selected to take a survey. 13 out of fifty participants said they would purchase the new program. The owners of Fitness Blender then devised a simulation based on the requirement that 35% of their users will purchase the program. Each dot in the graph shown below represents the proportion of users who would purchase Fitness Blender's new program, each of sample size 50, simulated 100 times.



Assume the set of data is approximately normal and that the owners of Fitness Blender want to be 95% confident of its results. Does the sample proportion obtained from the survey, 13 out of fifty, fall within the margin of error developed from the simulation? Justify your answer.

$\bar{X} \pm 2SD$ $\quad .35 + 2(0.067) = .484 \quad (.216, .484)$

$.35 - 2(0.067) = .216 \quad \frac{13}{50} = .26$ is in the interval.

Fitness Blender decides to move forward with the new program for its users even though only 13 out of 50 participants said they would purchase it. Describe how the simulation data could be used to support this decision.

Since .26 is in the 95% interval, they had evidence to support this decision.

15) According to the 2010 United State Census, the probability that a randomly selected male is 65 or older is 0.114, and the probability that a randomly selected female is 65 or older is 0.146.

If a male is selected at random and a female is selected at random, what is the probability that both people selected are 65 or older? *Round to the nearest thousandth.*

$$P(M>65 \overset{\text{and}}{\cap} F>65) = P(M>65)\cdot P(F>65)$$
$$= (.114)(.146)$$
$$= .017$$

If two females are selected at random, what is the probability that neither of them is 65 or older? *Round to the nearest thousandth.*

$$P(\text{Not } F>65) \cap \text{Not } F>65) = P(\text{Not } F>65)\cdot P(\text{Not } F>65)$$
$$=(1-.146)(1-.146)$$
$$= \boxed{.729}$$

16) Suppose that A and B are events in a sample space with $P(A) = 0.8$, $P(B) = 0.7$and $P(B|A) = 0.5$. Then $P(A \text{ and } B) =$

(1) 0.35

(2) 0.4

(3) 0.625

(4) 0.8

	A	Not A	
B	?		.7
Not B			.3
	.8	.2	1

$$\frac{x}{.8} = .5$$
$$x = .4$$

17) Alexis scored an 88 on her physics test. The class average was 79.3, and the standard deviation was 7.5. What is the z-score for Alexis's test score?

(1) 1.16

(2) 1.30

(3) 1.45

(4) 1.60

$$Z = \frac{88-79.3}{7.5} = 1.16$$

18) Events A and B are independent. What is $P(A \text{ and } B)$ if $P(A) = 0.3$ and $P(B) = 0.2$?

(1) 0.06

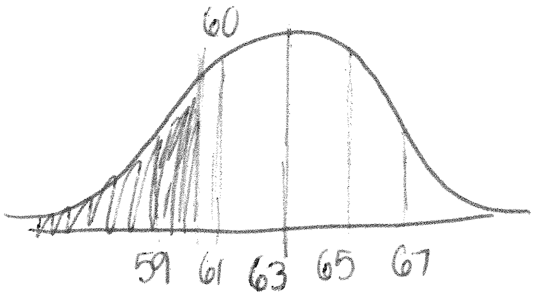
(2) 0.1

(3) 0.5

(4) 0.6

If Ind. $\rightarrow$ $P(A \text{ and } B) = P(A)\cdot P(B)$
$$=(.3)(.2)$$
$$= .06$$

19) In an Arlington, NY school, the heights of the population of girls are normally distributed with a mean of 63 inches and a standard deviation of 2 inches. If there are 450 girls in the school, determine how many of the girls are *shorter* than 60 inches. Round the answer to the nearest *integer.*

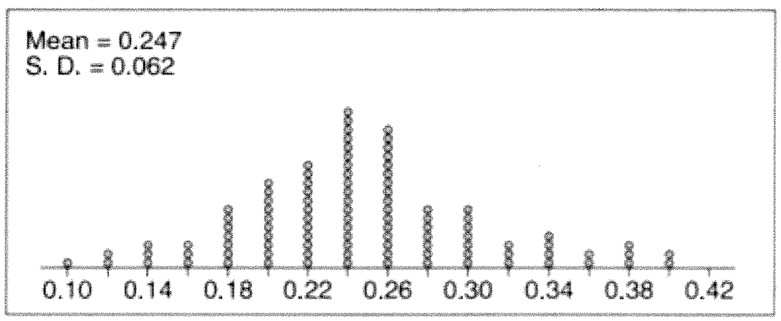


normalcdf(-999, 60, 63, 2)

= .067

$\frac{x}{450} = .067$ x = 30 girls

20) Stephen's Beverage Company is considering whether to produce a new brand of cola. The company will launch the product if at least 25% of cola drinkers will buy the product. Fifty cola drinkers are randomly selected to take a blind taste-test of products *A*, *B*, and the new product. Nine out of fifty participants preferred Stephen's new cola to product *A* and *B*. The company then devised a simulation based on the requirement that 25% of cola drinkers will buy the product. Each dot in the graph shown below represents the proportion of people of preferred Stephen's new product, each sample size 50, simulated 100 times.



Assume the set of data is approximately normal and the company wants to be 95% confident of the results. Does the sample proportion obtained from the blind taste-test, nine out of fifty, fall within the margin of error developed from the simulation. Justify your answer. MOE : 2(.062) = .124

9/50 = .18

$\bar{x} \pm 2SD$ .247 + 2(.062) = .371

.247 − 2(.062) = .123

(.123, .371)

yes, it falls inside the interval.

The company decides to continue developing the product even though only nine out of fifty participants preferred its brand of cola in the taste-test. Describe how the simulation data could be used to support this decision.

Since 9/50 falls within the 95% confidence interval, the company is confident in the decision to develop the product.