Extra Quiz Prep Questions

In the Japanese game show Sushi Roulette, the contestant spins a large wheel that's divided into 12 equal sections. Nine of the sections have a sushi roll and three have a wasabi bomb. When the wheel stops, the contestant must eat whatever food is on the section. To win the game, the contestant must eat one wasabi bomb.

Find the probability of finding the wasabi bomb on the second trial

Find the probability that it takes 3 or more spins for the contestant to get a wasabi bomb.

Is this binomial or geometric or neither? Explain.

Which of the following random variables is geometric?

a. The number of time I have to roll a die to get two 6s.
b. The number of cards I deal from a well-shuffled deck of 52 cards until I get a heart.
c. The number of digits I read in a randomly selected row of random digits table until I find a 7.
d. The number of 7s in a row of 40 random digits
e. The number of 6s I get if I roll a die 10 times

Seventeen people have been exposed to a particular disease. Each one independently has a 40% chance of contracting the disease. A hospital has the capacity to handle 10 cases of the disease.

Is this binomial or geometric?

What is the probability that the hospital's capacity will be exceeded?

A. 0.011 B. 0.035 C. 0.092 D. 0.965 E. 0.989

A test for extrasensory perception (ESP) involves asking a person to tell which of 5 shapes (circle, star, triangle, diamond, or heart) appears on a hidden computer screen. On each trial, the computer is equally likely to select any of the 5 shapes. Suppose researchers are testing a person who does not have ESP and is just guessing on each trial. What is the probability that the person guesses the first 4 shapes incorrectly but gets the fifth correct?

$A.\ \frac{1}{5}$ $B.\ \left(\frac{4}{5}\right)^4$ $C.\ \left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)^1$ $D.\ \binom{5}{1}\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)^1$ $E.\ \left(\frac{4}{5}\right)$

Ladies Home Journal magazine reported that 66% of all dog owners greet their dog before greeting their spouse or children when they return home at the end of the workday. Assume that this claim is true. Suppose 12 dog owners are selected at random. Let x equal the number of owners who greet their dogs first.

What is the expected value of x?

A. 5.41 B. 5.98 C. 7.92 D. 8.47 E. 8.83

What is the probability that less than 5 owners greeted their dog first?

A. 0.0213 B. 0.0489 C. 0.0821 D. 0.117 E. 0.138

Getting the Flu: Each month a company tracks how many people called in sick with the flu. The number calling in is shown below.

Flue cases	0	1	2	3	4	5
months	2	3	3	2	1	1

Create a relative frequency table for this situation:

Flue cases	0	1	2	3	4	5
Relative Frequency						

What is the probability that fewer than 2 people will call in sick with the flu in a randomly selected month?

What is the probability that at least 1 person will call in sick with the flu in a randomly selected month?

What is the expected number of people who will call in sick for a randomly selected month?

The company loses an average of $400 per employee who contracts the flu. Create a new distribution table for the cost to the company, find the expected cost for a randomly selected month, and find the probability that the company must spend over $1200.

The length of horse pregnancies varies according to a roughly Normal distribution with mean 336 days and standard deviation 3 days.

What is the probability that the pregnancy lasts longer than 340 days?

A. 0.025 B. 0.091 C. 0.145 D. 0.274 E. .909

What is the z-value for a pregnancy that lasts 332 days?

A. -1.33 B. -0.83 C. 0.83 D. 1.33 E. 1.87

70% of pregnancies last longer than x days. Find x rounded to the nearest day.

A. 330 B. 331 C. 332 D. 334 E. 335

What is the probability that the pregnancy lasts between 333 and 339 days?

A. .34 B. .52 C. .68 D. .95 E. .99

Researchers plan to collect sample data from each of the 100 veterinary hospitals in the state. Each sample will record the mean pregnancy length for a random group of 40 horses.

What is the expected value for the mean of a group of 40 horses?

What is the standard deviation for the mean of a group of 40 horses?

What is the shape for the sampling distribution of a group of size 40?

What is the probability that a randomly selected group of 40 horses have a mean pregnancy length of less than 334 days?

What is the probability that a randomly selected group of 40 horses have a mean pregnancy length of between 334 days and 337 days?

The length of pregnancies is actually skewed to the left. Does this change the shape of the sampling distribution of the mean?

Normal Distribution Review – Researchers in Norway analyzed data on the birth weights of 400,000 newborns over a 6-year period. The distribution of birth weights is Normal with a mean of 3668 grams and a standard deviation of 511 grams.

What is the probability of a baby weighing over 4000 grams?

What is the z-value for a baby that weighs 3750 grams?

85% of weigh more than x grams. Find x rounded to the nearest gram.

What is the probability that a baby weighs between 3000 and 4000 grams?

Researchers plan to collect sample data from each of the 100 hospitals in the state. Each sample will record the mean birth weight for a random group of 25 babies.

What is the expected value for the mean of a group of 25 babies?

What is the standard deviation for the mean of a group of 25 babies?

What is the shape for the sampling distribution for the mean?

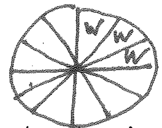
What is the probability that a randomly selected group of 25 babies have a mean weight of less than 3300 grams?

What is the probability that a randomly selected group of 25 babies have a mean birth weight of between 3350 grams and 3550 grams?

If the size of each sample increases to 100 babies, then how will the center, spread and shape of the sampling distribution change?

Quiz 13

Extra Quiz Prep Questions CH 6/7



In the Japanese game show Sushi Roulette, the contestant spins a large wheel that's divided into 12 equal sections. Nine of the sections have a sushi roll and three have a wasabi bomb. When the wheel stops, the contestant must eat whatever food is on the section. To win the game, the contestant must eat one wasabi bomb.

Find the probability of finding the wasabi bomb on the second trial

$\underset{\text{not was.}}{\underline{9/12}} \cdot$ then $\underset{\text{was.}}{\underline{\tfrac{3}{11}}} = \boxed{.2045}$

Find the probability that it takes 3 or more spins for the contestant to get a wasabi bomb.

opposite ~~not~~ 1st $\frac{3}{12} = .25$

~~not~~ 2nd $= .2045$

sum $= .4545$

$1 - .4545 = \boxed{.5455}$

Is this binomial or geometric?

Neither

Which of the following random variables is geometric?

a. The number of time I have to roll a die to get two 6s.
b. The number of cards I deal from a well-shuffled keck of 52 cards until I get a heart.
c. The number of digits I read in a randomly selected row of random digits table until I find a 7. 312782931102
d. The number of 7s in a row of 40 random digits – Bin.
e. The number of 6s I get if I roll a die 10 times – Bin

Seventeen people have been exposed to a particular disease. Each one independently has a 40% chance of contracting the disease. A hospital has the capacity to handle 10 cases of the disease.

2 things X = sick

Is this $\boxed{\text{binomial}}$ or geometric? p(x) = .4

indep. 17 trials count of 10

What is the probability that the hospital's capacity will be exceeded?

A. 0.011 B. 0.035 C. 0.092 D. 0.965 E. 0.989

A test for extrasensory perception (ESP) involves asking a person to tell which of 5 shapes (circle, star, triangle, diamond, or heart) appears on a hidden computer screen. On each trial, the computer is equally likely to sel t any of the 5 shapes. Suppose researchers are testing a person who does not have ESP and is just guessing on each trial. What is the probability that the person guesses the first 4 shapes incorrectly but gets the fifth correct?

A. $\frac{1}{5}$ B. $\left(\frac{4}{5}\right)^4$ C. $\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)^1$ D. $\binom{5}{1}\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)^1$ E. $\left(\frac{4}{5}\right)$

$\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$

Ladies Home Journal magazine reported that 66% of all dog owners greet their dog before greeting their spouse or children when they return home at the end of the workday. Assume that this claim is true. Suppose 12 dog owners are selected at random. Let x equal the number of owners who greet their dogs first.

Binomial trials = 12 p(success) = .66

What is the expected value of x?

A. 5.41 B. 5.98 $\boxed{\text{C. 7.92*}}$ D. 8.47 E. 8.83

What is the probability that less than 5 owners greeted their dog first?

A. 0.0213* B. 0.0489 C. 0.0821 D. 0.117 E. 0.138

Getting the Flu: Each month a company tracks how many people called in sick with the flu. The number calling in is shown below.

n=12

Flue cases	0	1	2	3	4	5
months	2	3	3	2	1	1

Create a relative frequency table for this situation:

Flue cases	0	1	2	3	4	5
Relative Frequency	.167	.25	.25	.167	.083	.083

What is the probability that fewer than 2 people will call in sick with the flu in a randomly selected month?

$\frac{5}{12}$

What is the probability that at least 1 person will call in sick with the flu in a randomly selected month?

opp. less than 1 $\frac{2}{12}$ $1-\frac{2}{12}=\frac{10}{12}$

What is the expected number of people who will call in sick for a randomly selected month?

2

The company loses an average of $400 per employee who contracts the flu. Create a new distribution table for the cost to the company, find the expected cost for a randomly selected month, and find the probability that the company must spend over $1200.

cost	0	400	800	1200	1600	2000
freq	2	3	3	2	1	1

800

$\frac{2}{12}$

The length of horse pregnancies varies according to a roughly Normal distribution with mean 336 days and standard deviation 3 days.

1 Horse (old)

What is the probability that the pregnancy lasts longer than 340 days?

A. 0.025 B. 0.091 C. 0.145 D. 0.274 E. .909

What is the z-value for a pregnancy that lasts 332 days?

A. -1.33 B. -0.83 C. 0.83 D. 1.33 E. 1.87

70% of pregnancies last longer than x days. Find x rounded to the nearest day.

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What is the probability that the pregnancy lasts between 333 and 339 days?

A. .34 B. .52 C. .68* D. .95 E. .99

NEW

Researchers plan to collect sample data from each of the 100 hospitals in the state. Each sample will record the mean pregnancy length for a random group of 40 women.

$n=40$ pop SD $=3$

$\mu=336$ $\sigma_{\bar{x}}=\frac{3}{\sqrt{40}}$

$\mu_{\bar{x}}=336$

What is the expected value for the mean of a group of 40 women?

336

What is the standard deviation for the mean of a group of 40 women?

$\frac{3}{\sqrt{40}} = .474$

What is the shape for the sampling distribution of a group of size 40?

Normal, it comes from a normal pop

What is the probability that a randomly selected group of 40 women have a mean pregnancy length of less than 334 days?

~zero

What is the probability that a randomly selected group of 40 women have a mean pregnancy length of between 334 days and 337 days?

.982

The length of pregnancies is actually skewed to the left. Does this change the shape of the sampling distribution of the mean?

NO, $n>30$ so $\bar{x}$ would still follow a normal curve by the CLT

Normal Distribution Review – Researchers in Norway analyzed data on the birth weights of 400,000 newborns over a 6-year period. The distribution of birth weights is Normal with a mean of 3668 grams and a standard deviation of 511 grams.

pop normal
$M = 3668$
$SD = 511$

What is the probability of a baby (OLI) weighing over 4000 grams?

.258

What is the z-value for a baby that weighs 3750?

$z = .16$

85% of weigh more than x ~~days~~ grams. Find x rounded to the nearest ~~pound~~ grams.

3138

What is the probability that a baby weighs between 3000 and 4000 pounds?

.646

Researchers plan to collect sample data from each of the 100 hospitals in the state. Each sample will record the mean birth weight for a random group of 25 babies.

$n = 25$

What is the expected value for the mean of a group of 25 babies?

pop $M = 3668$ $\sigma = 511$

$M_{\bar{x}} = 3668$ $\sigma_{\bar{x}} = \frac{511}{\sqrt{25}}$

102.2

3668 grams

What is the standard deviation for the mean of a group of 25 babies?

102.2 grams

What is the shape for the sampling distribution for the mean?

Normal – pop is normal

What is the probability that a randomly selected group of 25 babies have a mean weight of less than 3300 grams?

~ zero

What is the probability that a randomly selected group of 25 babies have a mean birth weight of between 3350 grams and 3550 grams?

.123

If the size of each sample increases to 100 babies, then how will the center, spread and shape of the sampling distribution change?

$\bar{x}$

$M_{\bar{x}} = 3668$

$\sigma_{\bar{x}} = \frac{511}{\sqrt{100}} = 51.1$

More normal than $n = 25$

More predictable