



Quiz 2



8/8 points
earned (100%)

Quiz passed!

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points

1.

What is the variance of the distribution of the average an IID draw of n observations from a population with mean μ and variance σ^2 .



$$\frac{\sigma^2}{n}$$



Correct Response

$$\text{Var}(\bar{X}) = \sigma^2/n$$



$$\sigma^2$$



$$\sigma/n$$



$$2\sigma/\sqrt{n}$$

1 / 1
points

2.

Suppose that diastolic blood pressures (DBPs) for men aged 35-44 are normally distributed with a mean of 80 (mm Hg) and a standard deviation of 10. About what is the probability that a random 35-44 year old has a DBP less than 70?

☐ 32%☐ 8%☐ 22%☒ 16%**Correct Response**

```
pnorm(70, mean = 80, sd = 10)
```

```
## [1] 0.1587
```

1 / 1
points

3.

Brain volume for adult women is normally distributed with a mean of about 1,100 cc for women with a standard deviation of 75 cc. What brain volume represents the 95th percentile?

☒ approximately 1223**Correct Response**

```
qnorm(0.95, mean = 1100, sd = 75)
```

```
## [1] 1223
```

- ☐ approximately 1175
 - ☐ approximately 1247
 - ☐ approximately 977
-



1 / 1
points

4.

Refer to the previous question. Brain volume for adult women is about 1,100 cc for women with a standard deviation of 75 cc. Consider the sample mean of 100 random adult women from this population. What is the 95th percentile of the distribution of that sample mean?

- ☐ approximately 1088 cc
- ☒ approximately 1112 cc



Correct Response

```
qnorm(0.95, mean = 1100, sd = 75/sqrt(100))
```

```
[1] 1112
```

- ☐ approximately 1110 cc
 - ☐ approximately 1115 cc
-



1 / 1
points

5.

You flip a fair coin 5 times, about what's the probability of getting 4 or 5 heads?

- ☐ 6%

☒ 19%

Correct Response

$$\binom{5}{4}2^{-5} + \binom{5}{5}2^{-5} \approx 19\%$$

```
pbinom(3, size = 5, prob = 0.5, lower.tail = FALSE)
```

```
## [1] 0.1875
```

☐ 3%

☐ 12%



1 / 1
points

6.

The respiratory disturbance index (RDI), a measure of sleep disturbance, for a specific population has a mean of 15 (sleep events per hour) and a standard deviation of 10. They are not normally distributed. Give your best estimate of the probability that a sample mean RDI of 100 people is between 14 and 16 events per hour?

☒ 68%

Correct Response

The standard error of the mean is $10/\sqrt{100} = 1$. Thus between 14 and 16 is with one standard deviation of the mean of the distribution of the sample mean. Thus it should be about 68%.

```
pnorm(16, mean = 15, sd = 1) - pnorm(14, mean = 15,  
sd = 1)
```

```
## [1] 0.6827
```

☐ 95%

- ☐ 34%
- ☐ 47.5%
-



1 / 1
points

7.

Consider a standard uniform density. The mean for this density is .5 and the variance is $1/12$. You sample 1,000 observations from this distribution and take the sample mean, what value would you expect it to be near?

- ☐ 0.75
- ☐ 0.10
- ☒ 0.5
-

Correct Response

Via the LLN it should be near .5.

- ☐ 0.25
-



1 / 1
points

8.

The number of people showing up at a bus stop is assumed to be

Poisson with a mean of 5 people per hour. You watch the bus

stop for 3 hours. About what's the probability of viewing 10 or fewer people?

- ☒ 0.12
-

Correct Response

```
ppois(10, lambda = 15)
```

```
## [1] 0.1185
```

- ☐ 0.03
- ☐ 0.06
- ☐ 0.08
-

