

✓ **Congratulations! You passed!**

TO PASS 80% or higher

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Quiz 2

LATEST SUBMISSION GRADE

100%

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 . 1 / 1 point

- ☐ σ^2
- ☐ $2\sigma/\sqrt{n}$
- ☐ σ/n
- ☒ $\frac{\sigma^2}{n}$

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

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? 1 / 1 point

- ☐ 32%
- ☒ 16%
- ☐ 8%
- ☐ 22%

✓ **Correct**
1 pnorm(70, mean = 80, sd = 10)

1 ## [1] 0.1587

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? 1 / 1 point

- ☐ approximately 1175
- ☐ approximately 1247
- ☐ approximately 977
- ☒ approximately 1223

✓ **Correct**
1 qnorm(0.95, mean = 1100, sd = 75)

1 ## [1] 1223

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? 1 / 1 point

- ☐ approximately 1110 cc
- ☐ approximately 1115 cc
- ☒ approximately 1112 cc
- ☐ approximately 1088 cc

✓ **Correct**
1 qnorm(0.95, mean = 1100, sd = 75/sqrt(100))

| | |
|---|----------|
| | |
| 1 | [1] 1112 |
| | |

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

1 / 1 point

- ☐ 6%
☐ 3%
☐ 12%
☒ 19%

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

| | |
|---|---|
| 1 | pbinom(3, size = 5, prob = 0.5, lower.tail = FALSE) |
| | |

| | |
|---|---------------|
| 1 | ## [1] 0.1875 |
| | |

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?

1 / 1 point

- ☐ 47.5%
☐ 34%
☒ 68%
☐ 95%

✓ **Correct**
 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%.

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

| | |
|---|---------------|
| 1 | ## [1] 0.6827 |
| | |

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?

1 / 1 point

- ☐ 0.10
☐ 0.75
☒ 0.5
☐ 0.25

✓ **Correct**
 Via the LLN it should be near .5.

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

1 / 1 point

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
☐ 0.08
☐ 0.03
☐ 0.06

✓ **Correct**

| | |
|---|------------------------|
| 1 | ppois(10, lambda = 15) |
| | |

| | | |
|---|---------------|--|
| 1 | ## [1] 0.1185 | |
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| | | |