

Stat 2000 International – Sample Midterm 2 - Answers

1. Correct answer: **d.** discrete random variable
2. Correct answer: **b.** 0.62
3. Correct answer: **c.** 4
4. Correct answer: **b.** \$145
5. Correct answer: **a.** 0.923
6. Correct answer: **b.** About 88.0F
7. Correct answer: **b.** to become more peaked
8. Correct answer: **d.** The sampling distribution of the proportion of "heads" in 50 flips of a fair coin would be skewed towards the higher values.
9. Correct answer: **b.** 68
10. Correct answer: **c.** \$268.33
11. Correct answer: **c.** describe the sampling distribution of sample proportions
12. Correct answer: **d.** 52% to 55%
13. Correct answer: **d.** We can be 95% confident that between 78% and 84% of all adults say they always wear seatbelts in the front seat of a car.
14. Correct answer: **c.** 22.1 to 23.9 [explanation: the most narrow interval]
15. Correct answer: **b.** We can be 90% confident that the true average body temperature of healthy adult Americans is between 98.17 and 98.44 degrees Fahrenheit.
16. Answer: $P(\text{at most } 5) = .60$
17. Answer: 56 expected blacks; $SD = 7.178$
18. Answer: They are the same: both 0.2.

19. Answer:

$$P(25 < s < 35) = P((n-1)*25^2/30^2 < (n-1)*s^2/30^2 < (n-1)*35^2/30^2) = P(9*225/900 < \text{Chi-squared on } n-1 < 9*1225/900) = P(2.25 < \text{Chi-squared on 9 df} < 12.25) = P(\text{Chi-squared on 9 df} > 2.25) - P(\text{Chi-squared on 9 df} > 12.25) = 0.9869 - 0.1996 = 0.7873$$

20. Answer: $n = 20$ and $p = 0.25$

21. Answer: 0.9125 or between 91st and 92nd percentile.

22. Answer: 0.733

For a height of 62, the z-score is $(62-65)/2.7 = -1.11$. In the probability calculator, type "-1.11" in the z-score box and click on "Left." The proportion of women with heights lower than 62 is 0.1335.

For a height of 68, the z-score is $(68-65)/2.7 = 1.11$. In the probability calculator, type "1.11" in the z-score box and click on "Left." The proportion of women with heights lower than 68 is 0.8665.

The proportion of women with heights lower than 68 is 0.8665, including those with heights below 62. And, the proportion of women with heights lower than 62 is 0.1335. Therefore, the proportion of women with heights between 62 and 68 is $0.8665 - 0.1335 = 0.733$.

23. Answer : 0.1013

In the binomial calculator, specify:

$$n = 50$$

$$p = 0.50$$

Prob X is "at least" "30"

The binomial calculator tells you that there is a 0.1013 chance that at least 30 of the 50 participants prefer Brand A.

24. Answer: 0

[explanation: $df = (\# \text{ rows} - 1) * (\# \text{ columns} - 1) = (3-1) * (2-1) = 2.$]

chance = 0

25. Answer: The two confidence intervals do not overlap. Therefore, we can conclude that the average weight change in a population of newborns continuously exposed to the sound of a heartbeat is greater than the average weight change in a population of newborns exposed to no sound.

To calculate a Z confidence interval for a mean in DataTools:

Click Stat > Z Statistics > One Sample.

Select the variable.

Type in the estimated sigma.

Click Next.

Click on Confidence Interval. The default level is 0.95.

Click Calculate.

Your DataTools output for the heartbeat population should look like:

95% Confidence interval results:

μ - mean of Variable (Std. Dev. = 63.94)

Variable	n	Sample Mean	Std. Err.	L. Limit	U. Limit
heartbeat	102	41.568626	6.331003	29.16009	53.977165

and your DataTools output for the control population should look like:

95% Confidence interval results:

μ - mean of Variable (Std. Dev. = 79.75)

Variable	n	Sample Mean	Std. Err.	L. Limit	U. Limit
control	112	-28.794643	7.5356665	-43.564278	-14.025007