

# Lesson 7: Probability Calculations Involving a Mean Response

## *Homework*

### Solutions

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| Problem | Part | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | -    | There are many possible sample means that could be obtained from a population. For example, if you draw a simple random sample of size 100 you will get a sample mean for that sample. However, if you drew a different random sample of size 100, you would get a different sample mean. Many different samples of size 100 could be drawn from a population and each of these samples will have its own sample mean. All of these possible sample means make up the sampling distribution. |
| 2       | -    | $z=0.186$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3       | -    | 0.426                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4       | -    | Mean = 529                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5       | -    | Standard Deviation = 20.631                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 6       | -    | Normal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 7       | -    | $z = 1.018$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 8       | -    | 0.154                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 9       | -    | Normal, with mean of 3.5 and standard deviation of 0.078                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 10      | -    | 0.005                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11      | -    | 0.319                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 12      | -    | 0.068                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13      | -    | $z = -1.25$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 14      | -    | 0.106                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 15      | -    | $z = -3.536$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 16      | -    | 0.0002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 17      | -    | Probability shrinks as the z-score moves further away from the mean. This is happening because we are shading in the applet only to the left of the z-score since the problems ask for the probability of an event being 'less than'. Therefore, as our z-score gets further away from the center, the smaller the probability will be on the left tail.                                                                                                                                     |

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