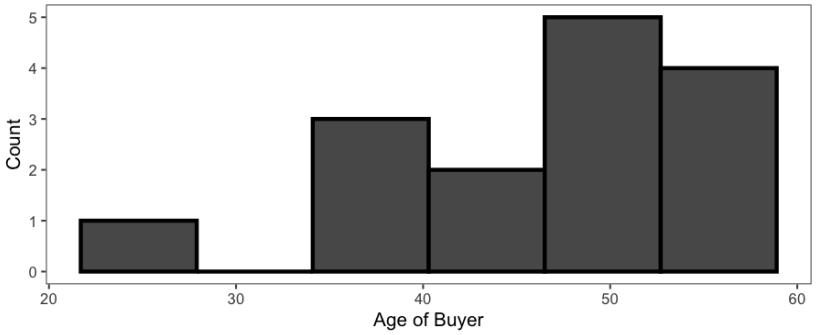
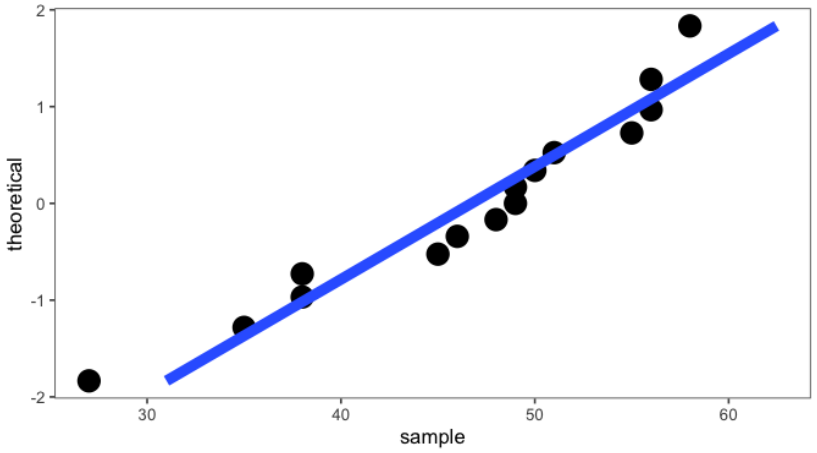
Lesson 9: Inference for One Mean; Sigma Known (Hypothesis Test)

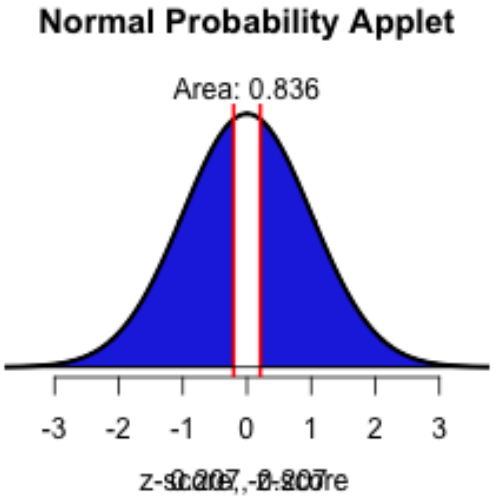
Preparation

Solutions

Problem	Part	Solution
1	-	Null hypothesis
2	-	One Side
		<table><tr><td colspan="2"></td><td colspan="2">Truth about the population (Reality)</td></tr><tr><td colspan="2"></td><td>H_o True</td><td>H_o is False</td></tr><tr><td rowspan="2">Decision based on sample (Conclusion)</td><td>Fail to Reject H_o</td><td>**Correct Decision**</td><td>**Type II Error**</td></tr><tr><td>Reject H_o</td><td>**Type I Error**</td><td>**Correct Decision**</td></tr></table>
3	-	
4	-	The level of significance is a number to determine if the P-value is small enough to reject the null hypothesis. It is denoted with the Greek letter alpha (α). It is the probability of making a Type I Error.
5	-	$z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$
6	-	P-value is the probability that you will observe the sample test statistic you did or one more extreme assuming the null hypothesis is true.
7	-	We have sufficient evidence to conclude the alternative hypothesis is true.
8	-	Answers may vary
9	A	$H_o : \mu = 529$ $H_a : \mu > 529$
9	B	A Type I error was committed.
9	C	There was about a 1 in 100 or 1% chance that there would be a Type 1 Error.
9	D	Increase the level of significance.
10	Design the study	The researcher collects data from the population of second home buyers. It says that he randomly selects his sample from his own clients. His research question is,'Is the average age of the people buying a second investment property in my area different than the national average?'
10	Collect the data	(Answers may vary)

Problem	Part	Solution
10	Describe the data	 **realtor_age** Min. :27.00 1st Qu.:41.50 Median :49.00 Mean :46.73 3rd Qu.:53.00 Max. :58.00
10	Make Inference-I	

Problem	Part	Solution
10	Make -Inference II	$H_o : \mu = 47$ years old $H_a : \mu \neq 47$ years old
10	Make Inference-III	$\alpha = 0.05$
10	Make Inference-IV	$\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$; z=-0.207
10	Make Inference-V	P-value = 0.836



10	Make Inference-VI	P-value is > level of significance ; 0.836 > 0.05 so we fail to reject the null hypothesis
10	Make Inference-VII	We have insufficient evidence to conclude that the mean age of people buying a second home is different in this area, than that of the national average of 47 .
10	Take Action	(Answers may vary) One could would suggest that the realtor keeps targeting that population of middle aged people as second home buyers.