Lesson 7: Probability Calculations Involving a Mean Response

Preparation

Solutions

Problem	Part	Solution
1	1	The parent population is normally distributed, so the sample mean is
		automatically normally distributed.
1	2	The sample size is large, and the Central Limit Theorem implies that the sample
		mean is normally distributed.
2	-	$z = (value - mean)/standard deviation.$ $Z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}}$
3	A	About 68% using the 68, 95, 99.7 rule or 0.6827 'exact'
3	В	40^{th} percentile = 8.7333
3	\mathbf{C}	Z = 1.7
3	D	Z = 0.4 so probability = 0.3446
3	\mathbf{E}	$z(\bar{x} < 8) = -0.4$ probability = 0.3446
		$z(\bar{x} > 12) = 0.4 \text{ probability} = 0.3446$
		0.3446 + 0.3446 = 0.6892
4	-	Normal
5	-	Normal
6	-	About 16% using the 68 , 95 , 99.7 rule or 0.1587 'exact'
7	-	About 95% using the 68 , 95 , 99.7 rule or 0.9545 'exact'
8	-	About 95% using the 68 , 95 , 99.7 rule or 0.9545 'exact'
9	-	$Probability(\bar{x} > 50) = 0.00621$
10	-	Right Skewed
11	-	Approximately Normal
12	-	Central Limit Theorem
13	-	No, the distribution is not normal, and the normal probability applet is only for
		normal distribution.
14	-	Probability = 0.9599
15	-	probability($\bar{x} < 37.5$) = 0.1056
		$probability(\bar{x} > 42.5) = 0.1056$
		1 - 0.1056 - 0.1056 = 0.7887