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	B	40^{th}percentile = 8.7333
3	C	$Z = 1.7$
3	D	$Z = 0.4$ so probability = 0.3446
3	E	$z(\bar{x} < 8) = -0.4$ probability = 0.3446 $z(\bar{x} > 12) = 0.4$ 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 $1 - 0.1056 - 0.1056 = 0.7887$