Stats: Critical Regions For A Sampling Distribution Hypothesis Test NEW

How to find critical regions for a sampling distribution hypothesis test.

We may need a calculator's Inverse Normal function.

Casio fx-991CW Classwiz	Casio fx-CG 50
1) Press HOME then select Distribution	1) Press MENU then 1 then OPTN
2) Select Inverse Normal	2) Press F5 for STAT
3) Set the Area* and the correct σ and μ	3) Press F3 for DIST and again for NORM
4) Select ● Execute and press EXE	4) Press F3 for InvN
	5) Input Area*, SD, and mean in that order
* Area must be to the left of your point	6) Press EXE

E1: Ngoneh is conducting a sampling distribution hypothesis test using X~N (40, 4).
Find the critical region if H_1: $\mu > 40$ and the significance level is 5%.

Method If Calculator Is Allowed	**Working**
1) Find the area required:	0.95
2) Use a calculator as above:	$x > 43.3$ to 3sf

Method If Solutions Relying On Calculator Tech Are Not Allowed	**Working**
1) Find the z-value in the Percentage Points of the Normal distribution table:	1.6449
2) Use the z-equation to find an x-value and give your critical region:	$1.6449 = \frac{x-40}{2}$ $3.2898 = x - 40$ $x > 43.3$ to 3sf

Questions

1) A sampling distribution hypothesis test is set up for X~N (80, 25).
Find the critical region if H_1: $\mu > 80$ and the significance level is 5%.

2) A sampling distribution hypothesis test is set up for X~N (100, 8^2).
Find the critical region if H_1: $\mu < 100$ and the significance level is 1%.

3) A sampling distribution hypothesis test is set up for X~N (64, 5).
Find the critical region if H_1: $\mu \neq 64$ and the significance level is 5%.

4) A Normally distributed variable has mean 125 and variance 36. A sample of 10 is taken to test that the mean has decreased. Find the critical region for a test at significance 1%.

5) A Normally distributed variable has mean 90 and variance 40. A sample of 20 is taken to test that the mean has changed. Find the critical region for a test at significance 10%.

6) A Normally distributed variable has mean 50 and standard deviation 8. A sample of 15 is taken to test that the mean has increased. Find the critical region for a test at significance 5%.

Answers

1) $x > 88.2$
2) $x < 81.4$
3) $x < 59.6 \cup x > 68.4$
4) $x < 120.6$
5) $x < 87.7 \cup x > 92.3$
6) $x > 53.4$