

Chi-Square Test for Normal Distribution

14.92 16.76 12.61 11.95 12.74 10.37 11.18 14.66
 11.95 14.12 14.10 15.78 16.72 13.95 11.30 11.62
 14.37 11.74 14.54 13.21 16.94 16.35 13.00 16.68
 16.05 15.29 15.30 15.51 16.04 12.22 16.03 11.03
 11.72 10.42 14.54 12.11 12.53 14.74 11.27 16.21

$n = 40$

H_0 : The population probability distribution is normal

H_a : the population probability distribution is not normal

$\bar{x} = 13.94925$

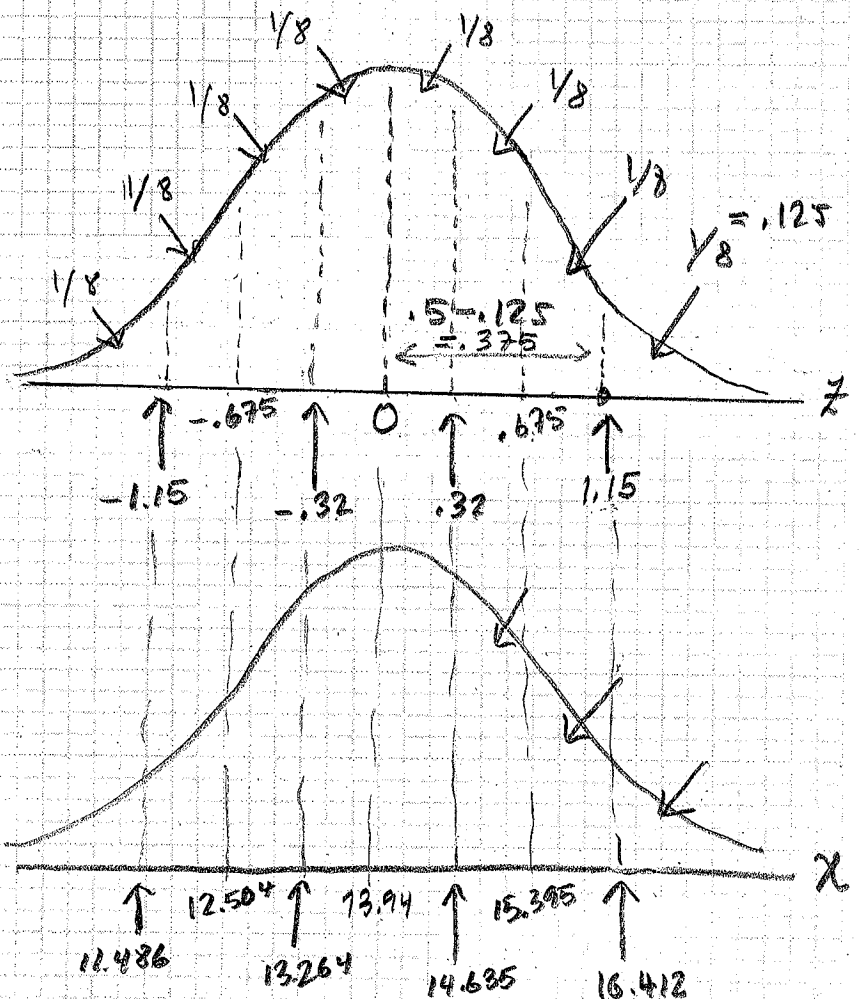
$s = 2.141577884$

$z = \frac{x - \bar{x}}{s} \Rightarrow$

$\Rightarrow x = \bar{x} + z \cdot s$

For $z = 1.15$

$x = 13.94925 + 1.15 \cdot 2.141577884$
 $= 16.412$



10.37 10.42 11.03 11.18 11.27 11.30 (11.62 11.72
 11.74 11.95 11.95 12.11 12.22) 12.61 12.74 13.00
 13.21 13.95 14.06 14.10 14.12 14.37 14.54 14.54
 14.74 14.92 15.29 15.30 15.51 15.78 16.03 16.04
 16.05 16.21 16.35 16.68 16.72 16.76 16.94 18.53

Interval	Observed	Expected	O-E	(O-E) ² /E
≤ 11.486	6	5	1	.2
11.486 to 12.504	7	5	2	.8
12.504 to 13.264	4	5	-1	.2
13.264 to 13.949	0	5	-5	5
13.949 to 14.635	7	5	2	.8
14.635 to 15.395	4	5	-1	.2
15.395 to 16.412	7	5	2	.8
≥ 16.412	5	5	0	0

$\chi^2 = 8$

H₀: P₁ = P₂ = ... = P₈ = 1/8

H_a: At least one of the proportions differs from 1/8

E₁ = n · P₁ = 40 * 1/8 = 5

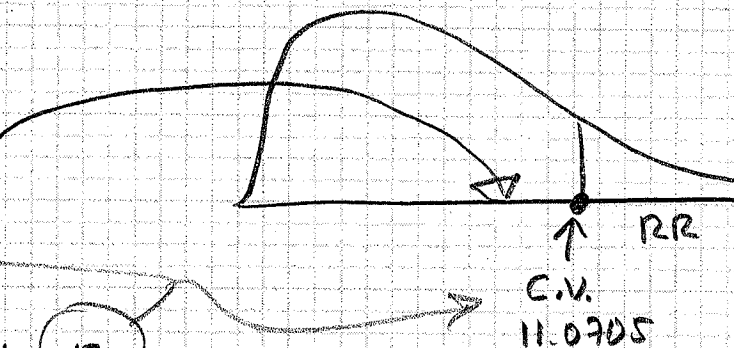
E₂ = n · P₂ =

$\chi^2 = \sum \frac{(O-E)^2}{E} = 8$

$\alpha = .05$

df = k - m - 1 = 8 - 2 - 1 = 5

m = # of parameters that need to be estimated



$$RR: \chi^2 > 11.0705$$

Decision: Fail to reject H_0

Conclusion: the distribution is approximately normal