

(12) State: H_0 : the true mean mpg in the city for this vehicle is 20
 H_a : the true mean mpg in the city for this vehicle is greater than 20

$$H_0: \mu = 20$$

$$H_a: \mu > 20$$

where μ = the true mean mpg for this vehicle in the city

Plan: 1 sample t-test for means

Conditions

Random - The problem states a random sample of 74 cars of a specific model are selected.

Independence - population of all vehicles $\geq 10(74)$
of this type

Conditions met

Large Counts - $n = 74$ $74 \geq 30$ CLT states the sample size is large enough to use approx Normal Distribution

$$Do: \bar{x} = 21.2973 \quad s = .6725511 \quad n = 74 \quad df = 73 \quad \alpha = .05$$

$$P\left(t > \frac{21.2973 - 20}{.6725511}\right) = P(t > 1.9289) = 0.0288$$

Since our p-value of .0288 is less than our significance level of .05, we have significant evidence to reject the null. We have evidence that it is plausible the mpg for this vehicle in the city is more than 20. Our data is significant.

df = 73 95% Conf Int (19.9569, 22.63769)

There are plausible values greater than 20 mpg.
The 95% conf interval supports our decision to reject
the null.