

Commute Time for Century Teachers



Last Name, First Name

Hypothesis

- We believe that the average commute time for teachers at Century is 30 min



Data

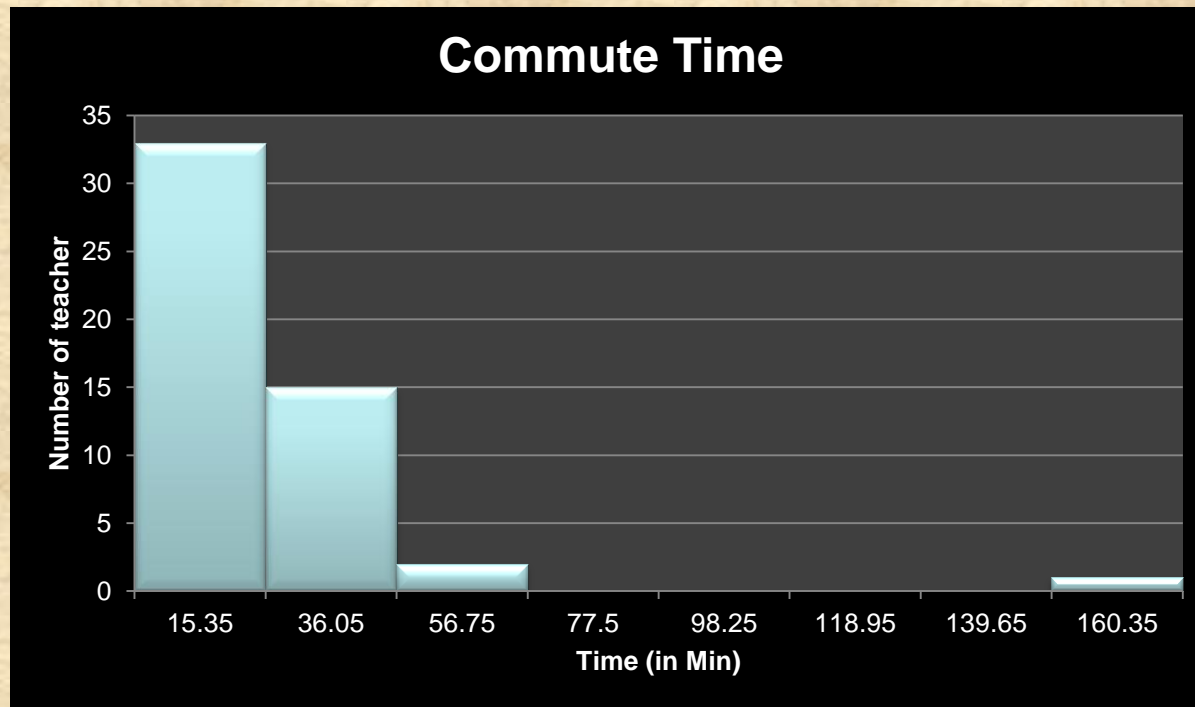
- Length of commute (in minutes)
- 35, 10, 40, 18, 45, 45, 35, 12, 30, 14, 22, 28, 20, 18, 10, 30, 18, 12, 30, 12, 21, 20, 60, 15, 20, 23, 35, 17, 23, 20, 7, 25, 17, 10, 30, 25, 45, 11, 12, 30, 25, 5, 18, 17, 60, 25, 150, 20, 40, 14, 30

Frequency Distribution Table

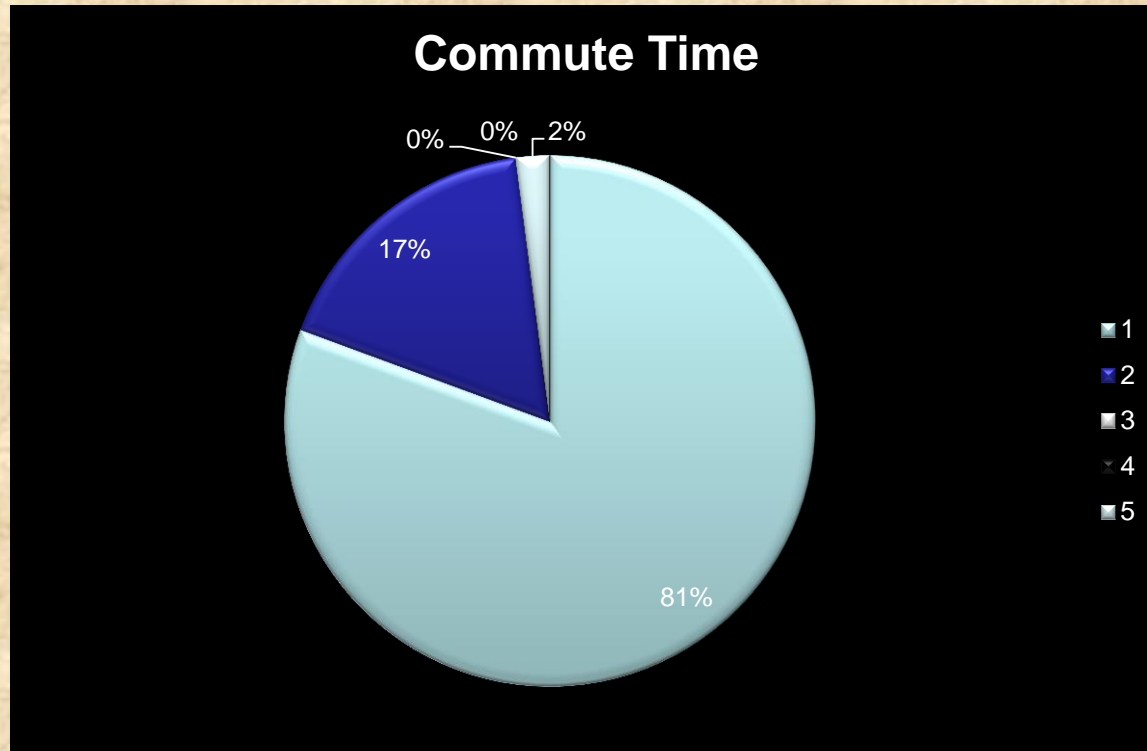
| Class | Frequency | Mid-Point | Relative Frequency | Cumulative Frequency |
|--------------|------------------|------------------|---------------------------|-----------------------------|
| 5-33 | 40 | 19 | 0.7843 | 40 |
| 34-62 | 10 | 48 | 0.1961 | 50 |
| 63-91 | 0 | 77 | 0 | 50 |
| 92-120 | 0 | 106 | 0 | 50 |
| 121-150 | 1 | 125 | 0.0196 | 51 |

Histogram

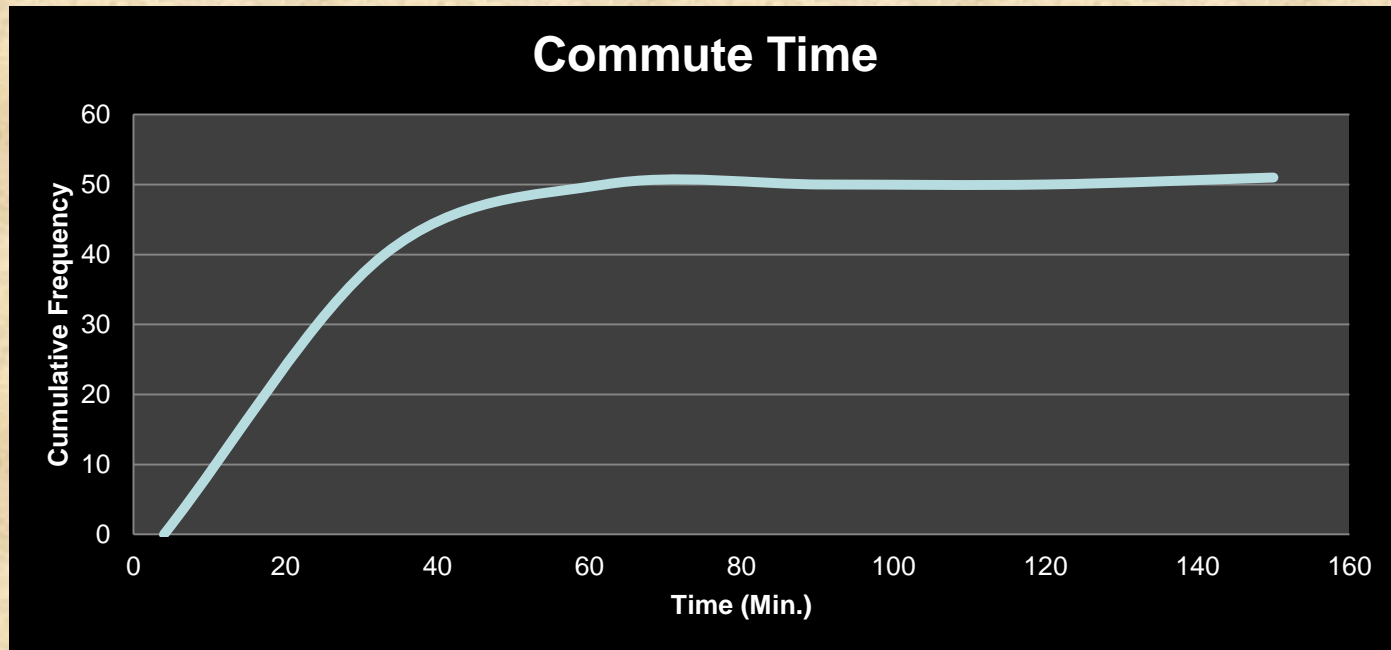
- At least 5 classes



Pie Chart



Ogive



Statistics

- From our survey, professors' sample commute mean time is 26.6 minutes with sample standard deviation 21.6 min.

$$\bar{x} = \frac{35 + 10 + 40 + \dots + 30}{51} \approx 26.6$$

$$s = \sqrt{\frac{23330}{51-1}} \approx 21.6$$



Confidence Interval

- **95% Confidence Interval**
- Z-Interval
- We are 95% confident mean commute time for all the teachers are between 20.6 to 32.6 minutes

$$\bar{x} = 26.6$$

$$\varepsilon = z_c \frac{s}{\sqrt{n}} = 1.96 \frac{21.6}{\sqrt{51}} = 6$$

$$\bar{x} - \varepsilon = 20.6$$

$$\bar{x} + \varepsilon = 32.6$$

Hypothesis Testing

- **Test Hypothesis**
- **Step I Hypothesis**

$$H_0 : \mu = 30 \quad (\text{claim})$$

$$H_a : \mu \neq 30$$

- **Step II p-value**

$$p - \text{value} = 0.261 > \alpha = 0.05$$

Conclusion

- We hypothesized that Century teachers' commute time average is 30 minutes. In our survey of 51 teachers, we find the sample mean of 26.6 minutes with a standard deviation of 21.6 minutes. We conclude that the population mean commute time for all the teachers is between 20.6 to 32.6 minutes with 95% confident. We test our initial hypothesis with 5% level of significance, and since our p-value is more than 5% level of significance, we fail to reject H_0 . Our hypothesis is correct.