

## Warm-up

In order to determine the mean amount of time seniors spend doing homework per weeknight, we take an SRS of 400 students and find a mean time of 77 minutes. Assume the standard deviation of all students to be 28 minutes. Construct a 95% confidence interval.

$$77 \pm 1.96 \frac{28}{\sqrt{400}}$$

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# Significance Tests

Work through #35 on page 543

$$\mu = 354 \quad \sigma = 33$$

over 3 weeks 405, 378, 411

$$\bar{X} = 398 \quad n = 3$$

Null Hypothesis (INNOCENCE)

$$H_0: \mu_0 = 354$$

Possible Alternate Hypotheses (SUSPICION)

$$H_a: \mu < \mu_0$$

Sales went down

$$H_a: \mu > \mu_0$$

Sales went up

$$H_a: \mu \neq \mu_0$$

Sales changed

## CALCULATIONS



TEST STATISTIC 
$$Z = \frac{398 - 354}{\frac{33}{\sqrt{3}}} \approx 2.31$$

p-value 
$$p = \text{normalcdf}(2.31, 99) = 0.0104$$

# Writing Conclusions

Significance level  $\alpha$  (cut-off point)   
 typical  $\alpha = .05$    
  $\alpha = .01$

$$p = .0104$$

$$\alpha = .05$$

\* Statistical Conclusion

$$\text{At } \alpha = .01$$

Fail to Reject the null hypothesis in favor of the  
alternate at the 5% level of significance since

$$\cancel{p < .05} \quad p > .01$$

\* Contextual Conclusion

There is <sup>not</sup> sufficient evidence to suggest  
that coffee sales increased.