Introduction to Statistics
Activity 9.4a **NAME:**

Hypothesis Testing Conclusions

You have an idea for a stationary business, featuring pens that can write, erase, do your taxes, shoot lasers, and are made of chocolate! You attract a venture capitalist investor, but they will only agree to finance your product development if you can show them that at least 45% of new businesses in Syracuse tend to survive more than 5 years – the national proportion. You look up the city records for businesses that were started five years ago – out of 165 businesses, 85 are still open.

a) With the following numbers, write a conclusion to present to your investor to convince them to fund your venture, in context! $p_0 = 0.45$, $\hat{p} = 0.51$, $n = 165$, $z = 2.5641$, $\alpha = 0.05$, P-value = 0.0052

Conclusion has three parts: Evidence, Decision, In-Context Summary.

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b) Given $p_0 = 0.45$ and $\hat{p} = 0.51$, did I do the math right? Please check the z-score and P-value. Does it change the decision?

You get the funding and are now finding sources for pen parts and different types of paper. You find a bulletproof origami paper that looks interesting. You want to know if $1.50 per sheet is a good deal. You check 23 other types of origami paper and find the average price per sheet is $1.35 with a standard deviation of $0.40. Is the bulletproof paper more expensive? If so, you won't carry it, but if it's not, it might be worth it due to its uniqueness.

c) With the following numbers, write a conclusion:
$\mu_0 = 1.50$, $\bar{x} = 1.35$, $n = 23$, $s = 0.6$, $t = 1.199$, $\alpha = 0.05$, P-value = 0.121

Conclusion has three parts: Evidence, Decision, In-Context Summary.

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(Remember to address whether you are buying it or not!)

d) Given only $\bar{x} = 1.35$ and $\mu_0 = 1.5$, did I do the math right? What's the actual t-score?

e) Why did I use t, and not z, as my test statistic?