

Graphing & Data Analysis Test Review

- 1) The following heights are a sample from a normally distributed group of 13 year olds. The heights are normally distributed in centimeters. Using the empirical rule, find the percent of students whose height falls between 130.8 cm and 202.4 cm. Round standard deviation to nearest tenth after all calculations.

120, 147, 136, 165, 128, 155, 177, 158, 139, 162

- 2) Using the table below, make a scatter plot of distance vs. temperature on graph paper. Draw a line of best fit and predict the temperature when the distance is 410 cm.

Distance (centimeters)	Temperature (degrees C)
505	91
460	75
513	95
495	78
347	38
380	44
365	42
451	70

- 3) A survey of 940 employees at an office claims that between 17% and 13% of employees goof off on non-work related websites at least once a day. How many of the 940 employees surveyed responded that they goof off on non-work related websites at least once a day? What is the margin of error for the survey?
- 4) A new diet claims to be extremely effective and make anyone lose weight fast. The diet lasts 12 weeks and includes a combination of special foods, exercise and medication. 10 people were weighed before and after the diet and the results are shown below. You are the statistician working for the diet company. They want you to perform an unbiased statistical analysis to prove that their product works. Assume a 95% confidence level. Using a separate sheet of paper, perform a dependent t-test for the data and include all of the following...

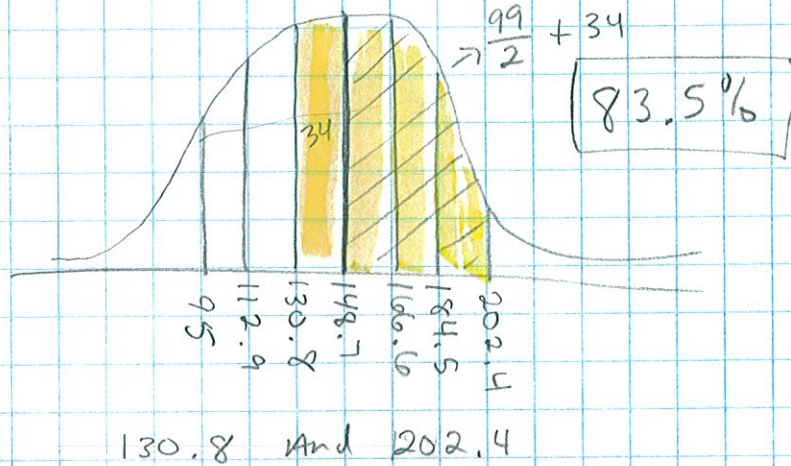
1. Null hypothesis
2. Confidence level in terms of α .
3. Calculate degrees of freedom and critical value.
4. Make a graph and inequality.
5. Calculate standard deviation and test statistic.
6. Explain your conclusion about whether or not the diet has a statistically significant impact on the subjects' ability to lose weight.

before	after
245	220
189	177
175	181
220	224
349	224
219	209
185	183
248	185
190	177
168	163

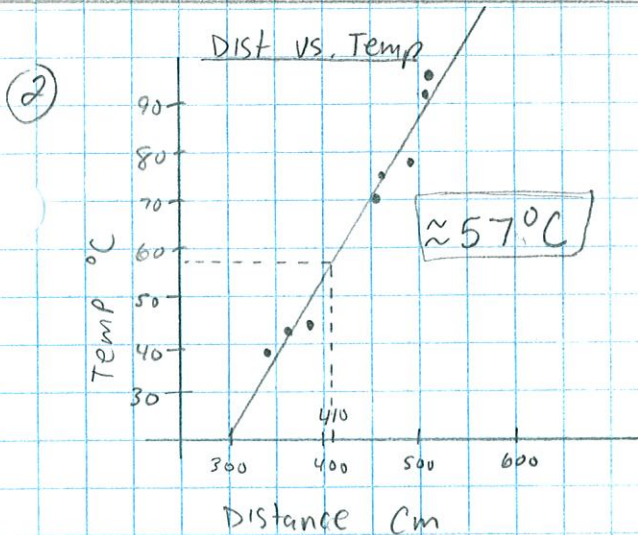
①

x	x ²
120	14400
147	21609
136	18496
165	27225
128	16384
155	24025
177	31329
158	24964
139	19321
162	26244
<u>1487</u>	<u>223997</u>
10	

$$sd = \sqrt{\frac{223997 - \frac{1487^2}{10}}{9}} = 17.888 \approx 17.9$$



Actual 80%



③

$$\frac{17\% - 13\%}{2} = 2\% \quad \text{Margin of Error} = \pm 2\%$$

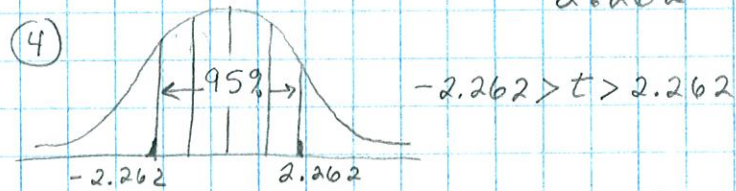
$$\frac{17\% + 13\%}{2} = 15\%$$

$$0.15 * 940 = 141 \text{ people}$$

① $H_0 \rightarrow \mu_{\text{before}} = \mu_{\text{after}}$

② $1 - .95 = \alpha = .05$

③ dof = 10 - 1 = 9 critical value 2.262



⑤ $sd = \sqrt{\frac{20713 - \frac{245^2}{10}}{9}} = 40.43$

$$t = \frac{24.5}{\frac{40.43}{\sqrt{10}}} = 1.916$$

⑥ 1.916 is inside the interval, therefore we do not reject $H_0 \rightarrow$ the diet didn't work.

④

before	After	ΔX	X^2
245	220	25	625
189	177	12	144
175	181	-6	36
220	224	-4	16
349	224	125	15625
219	209	10	100
185	183	2	4
248	185	63	3969
190	177	13	169
168	163	5	25
		<u>245</u>	<u>20713</u>