

OAS Skill Module: Statistics Homework (It's good for you)

(Use any help you want but tell me about it. Use Excel or any other software to generate data—you can even do it by hand!!)

1. A population consists of the following scores: 12, 1, 10, 3, 7, 3. Compute μ and σ for the population.
2. For a population with $\mu = 100$ and $\sigma = 10$, find the **Z** scores that corresponds to $X = 87$.
3. On a psychology exam with $\mu = 72$ and $\sigma = 12$, you get a score of $X = 78$. The same day, on an English exam with $\mu = 56$ and $\sigma = 5$, you get a score of $X = 66$. For which of the two exams would you expect to receive the better grade? Explain your answer.
4. Briefly define what is meant by the terms “distribution of sample means” and give an example.
5. What happens to the critical value of t for a particular confidence level when *degrees of freedom* increases in value?
6. A psychological theory predicts that individuals who grow up as an only child will have above-average IQs. A sample of $n=64$ people from single-child families is obtained. The average IQ for this sample is 104.9. In the general population, IQs form a normal distribution with $\mu = 100$ and $\sigma = 15$. Use a one-tailed test with $\alpha = .01$ (99% confidence) to evaluate the theory.
7. In a classic study of problem-solving, Duncker (1945) gave two groups of students the same materials to mount a candle on a wall. Duncker reasoned that the first group of subjects would have trouble seeing a “new” function for the box (a shelf) because it was already serving a function (holding tacks). For each subject, the amount of time to solve the problem was recorded. Do these data indicate a significant difference between the two conditions? Test at the .01 level of significance.

Time to Solve Problem (in seconds)	
Box of Tacks	Box and Tacks Separately
128	42
160	24
53	68
101	35
94	47

8. For the following set of data,
 - a. Sketch a graph showing the location of the five X, Y points.
 - b. Compute the Pearson correlation for this data set.

X	Y
8	2

9	2
2	4
1	5
5	2

9. It is known that blood type varies among different populations of people. In the US, for example, Types O, A, B and AB make up 45%, 41%, 10% and 4% of the population, respectively. Suppose blood type is determined for a sample of $n = 136$ individuals from a foreign country. The resulting frequency distribution is as follows:

	Type O	Type A	Type B	Type AB
f_0	43	38	41	14

Is there a significant difference between this distribution and what we could expect for the US? Set alpha at .05. I did not cover this kind of statistical test in the notes, so inquire as the best kind of test to use (hint: ask a biology friend.)

10. Do you love statistics or what?