

**Quiz 7 – 3/29/2023**

**Instructions.** You have 15 minutes to complete this quiz. You may use your plebe-issue TI-36X Pro calculator. You may not use any other materials.

Show all your work. To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem	Weight	Score
1a	1	
1b	1	
1c	1	
1d	2	
Total		/ 50

**Problem 1.** A researcher is interested in studying whether the weight of penguins differs by type. She gathers a random sample of the same number of penguins from each of the following five types: King, Emperor, Chinstrap, Royal, and Gentoo. For each penguin, she records its *Weight* and *Type*. She performs one-way ANOVA, using *Weight* as the response variable and *Type* as the explanatory variable. The ANOVA table is below – note that some entries of the table are missing:

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Type	??	22.74	5.685	20.159	7.79E-11
Residuals	65	18.31	(*)		

a. What are the treatments?

b. What is the total sample size?

c. What is the value of (\*) in the table? Provide your answer rounded to 3 decimal places.

d. Use a one-way ANOVA  $F$ -test with a significance level of 0.05 to answer the researcher's question. State all four steps.