

Quiz 9 – 4/18/2024

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	1	
1e	1	
Total		/ 50

Problem 1. In a study of 31 patients with esophageal cancer, researchers recorded the *Size* of the tumor (in cm) and whether the cancer had metastasized to the lymph nodes (*Metastasis* = 1 if yes, 0 if no). The researchers fit a logistic regression to predict the probability of metastasis based on the size of the tumor:

$$\log\left(\frac{\hat{\pi}}{1 - \hat{\pi}}\right) = -2.086 + 0.5117\text{Size} \quad \pi = P(\text{Metastasis} = 1)$$

a. Use this fitted model to estimate the odds of metastasis, if a patient's tumor size is 4 cm.

b. Use this fitted model to estimate the probability of metastasis, if a patient's tumor size is 4 cm.

c. Compute the odds ratio comparing the odds of metastasis for a 5 cm tumor versus a 4 cm tumor.

d. Interpret the odds ratio from part c in the context of the problem.

e. Sketch the curve of the probability form of the fitted model below.

