

Name _____

Student Number _____

STA 312 f2023 Quiz 8

1. (4 points) Let $T = e^{\mathbf{x}^\top \boldsymbol{\beta}} \times \epsilon$, where $\mathbf{x}^\top \boldsymbol{\beta} = \beta_0 + \beta_1 x_1 + \dots + \beta_{p-1} x_{p-1}$, and $\epsilon \sim \exp(1)$. The parameters $\beta_0, \dots, \beta_{p-1}$ are unobserved constants, while the explanatory variable values x_1, \dots, x_{p-1} are observed constants.

Derive the density of T . Show your work. Be sure to indicate where the density is non-zero, and where it is zero.

2. (3 points) Consider a Weibull regression model with *exactly two* explanatory variables. If x_1 is increased by one unit, the hazard function at time t is multiplied by _____. That's the *hazard* function. Show your work, starting with a convenient expression on the formula sheet. You have more room than you need. **Circle your answer.**

3. (3 points) In your analysis of the **cancer** data, you fit a Weibull regression model with just sex and physician's ECOG rating. You produced an estimate of median survival time for female patients with an **ecog** rating of 1, together with a 95% confidence interval. Write the following in the spaces provided.

(a) Estimated median survival time.

(b) Lower 95% confidence limit.

(c) Upper 95% confidence limit.

On your printout, circle the three numbers and write "Question 3" beside them.

Please attach your printout. Make sure your name is on it.