True/False - No explanation needed. (For each: 1 point if correct, 0 points if not answered, -1 points if incorrect)

1. For an exponential distribution with PDF ce^{-cx} for $x \geq 0$, the maximum likelihood parameter $\hat{c}$ is unbiased. True/False

2. Testing a two sided alternative leads to calculating probabilities of the form $P(|X| \geq |r|)$ or $P[|Z| \geq |z|]$. True/False

Problems - Needs justification.

1. Judie measures the size of butterflies. The wingspan of each type of butterfly is normally distributed with a standard deviation of 2 mms. Judie's null hypothesis is that a certain butterfly is a skipper, which has average wingspan of 26 mms. Her alternative hypothesis is that it is a butterfly with a **bigger** wingspan with significance level $\alpha = 0.04$. She measures a wingspan of 30 mms.

   (a) What is the rejection region associated with this problem?

   (b) What is Judie's conclusion?

   (10 points)