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

1. For a geometric distribution $X \sim \text{Geom}(p)$, the maximum likelihood parameter $\hat{p}$ is unbiased. True/False

2. In a hypothesis test we have the formula

$$\text{power} + \text{significance} = 1$$

True/False

Problems - Needs justification.

1. A university lab detects radio waves from outer space. Radio waves from Voyager 1 occur according to a normal distribution with a mean of 10 gigahertz and a standard deviation of .75 gigahertz. The lab receives a radio message at 12 gigahertz. If the alternative hypothesis is that a satellite with different frequency is sending radio waves with a different average frequency, can they refute the assumption that they are receiving information from Voyager 1 with confidence level $\alpha = 0.05$? (10 points)