Hypothesis Tests and confidence intervals – 2022 GCE Statistics Further Math A Y542

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The random variable X was assumed to have a normal distribution with mean μ. Using a random sample of size 128, a significance test was carried out using the following hypotheses.

H_0: $\mu = 30$

H_1: $\mu > 30$

It was found that $\sum x = 3929.6$ and $\sum x^2 = 123\,483.52$. The conclusion of the test was to reject the null hypothesis.

(a) Determine the range of possible values of the significance level of the test. **[5]**

(b) It was subsequently found that X was not normally distributed.

Explain whether this invalidates the conclusion of the test. **[2]**