The questions in black all belong to the same scenario, and the questions in red belong to a second scenario. We'll alternate between them in class.

Suppose you have a random sample of size 17. We wish to test the null hypothesis that the mean is 30. Suppose you will reject the null hypothesis if the outcome of the sample mean is less than x. What value of x is needed so that there is a 5% probability of erroneously rejecting the null hypothesis if it were true?

Suppose you have a random sample of size 27. We wish to test the null hypothesis that the mean is 30. Suppose you will reject the null hypothesis if the outcome of the sample mean is greater than 31. What would the probability of erroneously rejecting the null hypothesis be if it were true?

If the true value of the mean is 29, what is the probability that we reject the null hypothesis?

If the true value of the mean is 29, what is the probability that we conclude the null hypothesis is plausible?

How large of a sample would we need to have 80% probability of rejecting the null hypothesis if the mean were 29?

How large of a sample would we need to have 90% probability of rejecting the null hypothesis? Express your answer as a function of the true value of the mean, μ.