Offensive linemen in the National Football League (NFL) are very large, heavy men, with their weights approximately normally distributed with mean 320 pounds (lbs) and variance 720 lbs². In the Spring 2016 draft, \( n=45 \) linemen were drafted and their mean weight was 335 pounds. Assuming that the variance of the drafted linemen was the same as the current players, test at level \( \alpha=.05 \) the hypothesis that the drafted linemen had the same mean weight as current players against the alternative that the drafted linemen were heavier.

a) What is the power of this test at the alternative \( \mu_a=325 \)? at \( \mu_a=330 \)?

b) What sample size would be needed to make the above test have power \( 1-\beta=.80 \) at the alternative \( \mu_a=325 \) lbs?

c) Give the \( p \)-values for the three situations where the observed sample mean weight (\( Y\)-bar) were 325, 327, and 330 lbs. (It was 335 on the quiz.)