**Type I and Type II errors**

Managers at an automobile manufacturing plant would like to examine the mean completion time, , of an assembly line operation. The past data indicate that the mean completion time is minutes, but the managers have reason to believe that this value has decreased. The managers plan to perform a [statistical test](http://www.phoenix.aleks.com/alekscgi/x/Isl.exe/171DELZ7DLueDF5ZopIedkR46dcKJzObt64es4aCbcjbDuSHfR1jf4HsoDkmskqSfMnqEN-_6WbStMzl8sUttAGZmc54v4F8DRgi3ASKe5N2ZsAYmcq?18nVJUIk1HSdvAgrxojkjyKZlJ0Nd-9Rd2Ieg6Pu6i0w5Jd3Uf803MoAkKbZ7IBg7Bgans7eDUaj2O0dNolbE6RoKVTrt0MQD64J-geRTj0N0PjVH3oxdjo).

After choosing a [random sample](http://www.phoenix.aleks.com/alekscgi/x/Isl.exe/1EMdJe1xBeVcBY7jWgFc5l90nXRsawKAVbDcQRYR8byABnvbeuMaeR-_WHvSQMD8ejAEJzKCnCm8VjVNOiBBVd5G0r70ER0iBa_ZChvVitwf2BM_0ro?1MN4gKruFx-a6QAwX0kukpGLhA2wpVwlT4a7rKmpQyQQVIX3VfTx_7enonNJO5PbU0hEDaKzlCnltsUf-_f5an3lwsW-2Egmw9Q7TguR7jCNsPg2) of assembly line completion times, the managers compute the sample [mean](http://www.phoenix.aleks.com/alekscgi/x/Isl.exe/1orBV_i-T_-iTRTlm8UxJVpsIY72fqasn-1iXJsry-zsTbL546rm4JjQmytxXTA34ABTVKapILE3nAOLU9PGnFul8sTYtJJOTcNzznL2Yj2b9Hbv8so?1-Do3lq7ckjLHxB1ZW67uwvCahxpckxLUih65-zDgbNC45rCddxUuD1l0j2OSWb5tCLqU-sa_If5aFLlwYwfpD-Lnh_GU2zqV-CfU) completion time to be minutes. The [standard deviation](http://www.phoenix.aleks.com/alekscgi/x/Isl.exe/1_PLtPg3qPdtqvW9jL18EYVyi8uoVbty6sUtFBhHkV7yqraAgSPXgBcUj5a8FYUig1XKtcRvitFi61kkyzrn6ZL9bVW6MBMZqSqOPZao4O0H_z_CbVq?1N1oN8Z7jZQLY9x1mK57LrRIcSjmg_iwL02tzVF8HCImICynWdG1aAA0BOwFnMNMnUqzz9ON8mhOhWIStlnqY-VP_zf43FZR8-UigEBQUhIesg7sEfAiico) of the [population](http://www.phoenix.aleks.com/alekscgi/x/Isl.exe/1icWkAVEdA2Hd-FswrHhb4EDLb38y2Ie1LYhPDUjetNDdCqMuWS_uDXBwdqpP4YruRsmkWInLM7q1R2fiPG11cosptFN9D-1dHvKTcq8hYW-V_cJptR?1epF1YLANn_1OW6kA54AVbN4gScKhBsdkV7Np-8y3CIJkpJbFP-aXQHa9s8zPnQWeSy2WYHil1Xk3h4vibFxxeXWy96Mun3yKVTw31JkLh5M6) of completion times can be assumed not to have changed from the previously reported value of minutes.

Based on this information, answer the questions below.

What are the null hypothesis and the alternative hypothesis that should be used for the test? \_\_\_\_\_\_\_\_

In the context of this test, what is a type II error? \_\_\_\_\_\_\_\_\_

A type II error is\_\_\_\_\_\_\_\_\_\_, the null hypothesis that is µ is\_\_\_\_\_\_\_\_\_\_ when, in fact, µ is \_\_\_\_\_\_\_\_

Suppose that the managers decided not to reject the null hypothesis. What sort of error would they be making? \_\_\_\_\_\_\_\_\_\_\_