1. A testing company is checking to see whether there is any significant difference in the coverage of two different brands of paint for a hardware store chain. The results are summarized below.   
Amazon Paint Coverup Paint  
Sample mean coverage (in square feet) 305 295  
Population standard deviation 20 25  
Sample Size 40 45

Conduct a two-tailed test is used with a 0.05 level of significance.

2. A drug trial is attempted using a real drug and a pill made of just sugar. 18 people are given the real drug in hopes of increasing the production of endorphins. The increase in endorphins is found to be on average 8 micrograms per person, and the sample standard deviation is 5.4 micrograms. 11 people are given the sugar pill, and their average endorphin increase is 4 micrograms with a standard deviation of 2.4. From previous research on endorphins it is determined that it can be assumed that the variances within the two samples can be assumed to be the same. Test at 5% to see if the population mean for the real drug had a significantly greater impact on the endorphins than the population mean with the sugar pill.

3. A study was conducted to investigate the effectiveness of hypnotism in reducing pain. Results for randomly selected subjects are shown in the table below. A lower score indicates less pain. The "before" value is matched to an "after" value and the differences are calculated. Are the sensory measurements, on average, lower after hypnotism? Test at a 5% significance level.

| **Subject:** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Before | 6.6 | 6.5 | 9.0 | 10.3 | 11.3 | 8.1 | 6.3 | 11.6 |
| After | 6.8 | 2.4 | 7.4 | 8.5 | 8.1 | 6.1 | 3.4 | 2.0 |