Power practice problems

1. (a) A researcher tests the effects of group influence on confidence ratings (on a 10 pt. scale) for a line judgment task. It is predicted that group influence will increase confidence judgments. She anticipates group influence will have a small effect (i.e., d = .25). If the population mean for the no group influence is 5.0 with a population standard deviation of 2.0, what would power be if she conducted the study with 100 participants with an alpha level of .05?

answer
power = .8023

(b) What would power be if she decided to run the study with only 25 participants?

answer
power = .3446

2. A new drug is believed to significantly reduce pain. The size of the effect is predicted to be large (d = .80). When participants who are not given the drug are given a standard pain stimulus (arm immersed in ice water for 3 minutes) and asked to give a pain rating on a 1-20 scale, the population mean is 17 with a population standard deviation of 3.

(a) What is the population mean and population standard deviation predicted to be for those who receive the drug?

(b) What would the power be if the study is conducted with n = 16?

(c) If the effect size was much smaller (d = .30), what would power be if n = 49?

Answers

a. pop mean = 14.6, pop st. dev = 3
b. power = .9394
c. power = .6700

3.
If power = .60, μ_o = 500, and σ = 100, and n = 100, then what is μ_1 if α = .05 for a one-tailed test where the effect is predicted to be positive?

answer μ_1 = 519.