

Instructions: Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. Your company wants to improve sales. Past sales data indicate that the average sale was \$121 per transaction. After training your sales force, the manager wants to be able to obtain a power of 80% at the level of a \$32 improvement. Can they obtain that power from a sample of 25 salespeople? If not, how big a sample is needed? Assume that the old standard deviation (before training) was \$13 and that this has not changed after training.

pwr package

pwr.t.test (n=25, d = $\frac{32}{13}$, sig.level = 0.05, power = NULL, type = "one.sample")

power = 1

So, yes, this is achievable

2. The table below shows a sample of men and women from a local gym. Do men and women have different percentages of body fat? (Use $\alpha = 0.05$.) Clearly state your hypotheses and state your conclusion in the context of the problem. Describe the kind of two-sample test you are conducting and why. Is the data approximately normally distributed?

Group	Body Fat Percentages				
Men	13.3	6.0	20.0	8.0	14.0
	19.0	18.0	25.0	16.0	24.0
	15.0	1.0	15.0		
Women	22.0	16.0	21.7	21.0	30.0
	26.0	12.0	23.2	28.0	23.0

$$H_0: \mu_1 = \mu_2$$

$$H_a: \mu_1 \neq \mu_2 \quad \text{unpooled}$$

$$t = -2.8957\dots$$

$$p = 0.0086\dots$$

reject null

the means are different

3. In June, a poll was conducted in a particular congressional race: 600 people were surveyed and preferred Candidate A to Candidate B at 53% to 48%. In a poll in October, 550 people were surveyed and found that Candidate A received only 49%. Conduct a hypothesis test to determine if the rate of support for Candidate A has changed since the last poll. Clearly state your hypotheses and state your conclusion in the context of the problem. Be sure to test any assumptions.

$$H_0: p_1 = p_2$$

$$H_a: p_1 < p_2$$

$$z = 1.324$$

$$p = 0.90736 \quad \text{reject null}$$

no, there is not sufficient evidence to think results have changed