Answer Key: One-Sample t Test

1.) a. critical t = ± 2.262   b. critical t = ± 2.750
c. critical t = ± 2.021   d. critical t = ± 2.626

2.) <u>Your answer</u>

3.) a. Increased variability of scores affects the denominator by increasing it. The computed t-value would be closer to zero.

   b. Increased sample size lowers the S_M in the denominator, which would increase computed t.

   c. Increased mean difference (M - μ) would increase the numerator, causing computed t to increase.

4.) <u>Your answer</u>

5.) <u>What is known:</u> df = 24   alpha = .01   Critical t = ±2.797

   <u>Needs to be known:</u> $S_M = \dfrac{9}{\sqrt{25}} = 1.8$

   Computed t $= \dfrac{15-12}{1.8} = \mathbf{1.67}$

-2.797   0   2.797
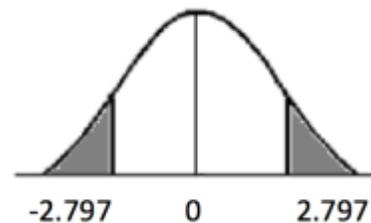
Four-Part Conclusion: 1) A one-sample, t-test was conducted to determine whether a new physical education program would significantly increase the number of push-ups performed by a sample of 25 5th graders. 2) There was insufficient evidence to reject the null hypothesis, t(24)= 1.67, p> .01. 3) The average number of push-ups completed (avg.=15) by those 25 5th graders subjected to the new physical education program was not significantly greater (statistically) than the average number of push-ups (avg.=12) completed by 5th graders in the general population. 4) Therefore, the new physical education program will not be adopted. Perhaps future studies could incorporate more 5th

graders or even students in other grades. Alternative physical education programs might also be looked at.

6.) <u>Your answer</u>

7.)
    a. Average annual rainfall last 49 years = 7.73 inches
    b. t= -7.188
    c. Reject the null
    d. sig(2 tailed)= .000000004
    e. Denver, Colorado's average annual rainfall (7.73 inches) over the last 49 years is significantly lower than the overall, average annual rainfall (11 inches), $t(48) = -7.188$, $p < .05$.