Exact Test for Single Variance

1. A random sample of size 10, drawn from a normal population, constitutes the observations 62, 63, 64, 65, 67, 67, 68, 69, 70, 72. Test the hypothesis that the population standard deviation is 2,

When

1. the population mean is known to be 66
2. the population mean is unknown

1. A manufacturer of hard safety hats for construction workers is concerned about the mean and the variation of the forces its helmets transmits to wearers when subjected to an external force. The manufacturer has designed the helmets so that the mean force transmitted by the helmets to the workers is 800 pounds with a standard deviation to be 40 pounds. Tests were run on a random sample of n = 40 helmets, and the sample mean and sample standard deviation were found to be 825 pounds and 48.5 pounds, respectively. Do the data provide sufficient evidence, at the α = 0.05 level, to conclude that the population standard deviation **exceeds** 40 pounds?