For the following hypotheses and observed data, calculate the t-statistic and pvalue. Throughout μ is the population mean.

1. $H_0 : \mu = 0$ vs $H_a : \mu \neq 0$ with $n = 36$, $\overline{x} = 2$, and $s = 10$.

2. $H_0 : \mu = 7$ vs $H_a : \mu < 7$ with $n = 49$, $\overline{x} = 5$, and $s = 6$.

3. $H_0 : \mu \leq -3$ vs $H_a : \mu > -3$ with $n = 25$, $\overline{x} = 0$, and $s = 8$.

4. A call center knows its typical waiting time for a caller is 15 minutes. This past week seemed exceptionally busy to the call center manager. She took a random sample of 120 callers and found an average wait time of 16 minutes with a standard deviation of 7.

5. In 2017, US individuals 24 years old and younger watched an average of 32 hours of TV per week. Nielsen, the company that collects these data, is wondering if the average in 2018 is different than it was in 2018. A random sample of 1,000,000 individuals 24 years old and younger indicated that those individuals watched an average of 31.9 hours of TV in one week with a standard deviation of 10.

6. Fighting Burrito believes its customers will prefer the old butter-based recipe for its questo comapred to the marginarine-based recipe. Based on past surveys, the butter-based recipe receives a 7.7 rating out of 10. Fighting Burrito collects a random sample of 20 customers who order the margarine-based queso and found an average rating of 8.2 out of 10 with a standad deviation of 2.