

Section 8.3 Hypothesis Test Practice

Some people believe that the earth's magnetic field guides some animals as they travel over great distances. A biologist wanted to determine whether monarch butterflies have some magnetic material in their bodies. The biologist used a tool called a magnetometer for this test. The magnetometer measures electromagnetic units that are called *pico-emus*. Unfortunately, the magnetometer itself creates some magnetic intensity. The magnetometer creates about 200 pico-emus of magnetic intensity. (A pico-emu is 10^{-12} electromagnetic units.) In order to demonstrate that monarch butterflies have some magnetic material in their bodies, the measurements need to show that the monarch butterflies mean magnetic intensity is greater than 200 pico-emus. To test this claim at 5% significance, the researcher gathered 45 monarchs and measured a mean of 289.8 pico-emus. Some evidence suggests that the population standard deviation is 141.5 pico-emus. (This is a section 8.3 problem.)