STAT 340

Chapter 14 - Practice Questions Part II

Hypothesis Testing

1. Write the null and alternative hypotheses for the following scenarios.

a. A random sample of students is tutored to see if tutoring will improve scores on a calculus exam. In the past the average was 75.

b. A counselor claims that students spend 2 hours studying for each hour of class. A skeptic believes that the amount of studying is less than this.

c. Pain pills are supposed to have an average of 25 mg of active ingredient. Being above or below 25 is bad. We take a random sample of pills and test them.

2. Blood levels of inorganic phosphorus are known to vary Normally among adults, with mean 1.2 and standard deviation 0.1 mmol/l. The average inorganic phosphorus level of a random sample of 12 healthy elderly subjects is 1.128 mmol/l. Is the true mean inorganic phosphorus level lower among the elderly (people aged 75 to 79 years)?

$X =$

$\mu =$

$\sigma =$

$X \sim N(\quad , \quad)$

$\bar{X} =$

$n =$

$\bar{X} \sim N(\quad , \quad)$

a. Write the null and alternative hypotheses.

b. Calculate the test statistic.

$$z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$$

c. Find the p-value.

d. Write the conclusion.