

Solutions

Investigate the claim that the mean volume of water in the watering can is 520ml

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|---|--|--|--|
| <input checked="" type="checkbox"/> $H_0: \mu = 520\text{ml}$ | <input type="checkbox"/> $H_0: \mu < 520\text{ml}$ | <input type="checkbox"/> $H_1: \mu = 520\text{ml}$ | <input type="checkbox"/> $H_1: \mu < 520\text{ml}$ |
| <input type="checkbox"/> $H_0: \mu \neq 520\text{ml}$ | <input type="checkbox"/> $H_0: \mu > 520\text{ml}$ | <input checked="" type="checkbox"/> $H_1: \mu \neq 520\text{ml}$ | <input type="checkbox"/> $H_1: \mu > 520\text{ml}$ |

Investigate the claim that the mean width of the doorways has decreased from 94cm

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| <input checked="" type="checkbox"/> $H_0: \mu = 94\text{cm}$ | <input type="checkbox"/> $H_0: \mu < 94\text{cm}$ | <input type="checkbox"/> $H_1: \mu = 94\text{cm}$ | <input checked="" type="checkbox"/> $H_1: \mu < 94\text{cm}$ |
| <input type="checkbox"/> $H_0: \mu \neq 94\text{cm}$ | <input type="checkbox"/> $H_0: \mu > 94\text{cm}$ | <input type="checkbox"/> $H_1: \mu \neq 94\text{cm}$ | <input type="checkbox"/> $H_1: \mu > 94\text{cm}$ |

During a particular week, 43 babies were born in a maternity unit. Part of the standard procedure is to measure the circumference of the babies head. This sample of 43 babies had a mean head circumference of 38cm.

Assuming that this sample came from an underlying normal population, test at the 5% significance level, the hypothesis that the population mean head circumference is 40cm. What are the hypotheses for this test?

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| <input checked="" type="checkbox"/> $H_0: \mu = 40\text{cm}$ | <input type="checkbox"/> $H_0: \mu < 40\text{cm}$ | <input type="checkbox"/> $H_1: \mu = 40\text{cm}$ | <input type="checkbox"/> $H_1: \mu < 40\text{cm}$ |
| <input type="checkbox"/> $H_0: \mu \neq 40\text{cm}$ | <input type="checkbox"/> $H_0: \mu > 40\text{cm}$ | <input checked="" type="checkbox"/> $H_1: \mu \neq 40\text{cm}$ | <input type="checkbox"/> $H_1: \mu > 40\text{cm}$ |

The weights of metal screws are known to be normally distributed with a mean of 6.5mg. A random sample of 50 metal screws is taken from a production line. They are each weighed and the mean of the sample is found to be 6.62mg.

Investigate the claim that the mean weight exceeds 6.5mg using a 10% significance level. What are the hypotheses for this test?

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| <input checked="" type="checkbox"/> $H_0: \mu = 6.5\text{mg}$ | <input type="checkbox"/> $H_0: \mu < 6.5\text{mg}$ | <input type="checkbox"/> $H_1: \mu = 6.5\text{mg}$ | <input type="checkbox"/> $H_1: \mu < 6.5\text{mg}$ |
| <input type="checkbox"/> $H_0: \mu \neq 6.5\text{mg}$ | <input type="checkbox"/> $H_0: \mu > 6.5\text{mg}$ | <input type="checkbox"/> $H_1: \mu \neq 6.5\text{mg}$ | <input checked="" type="checkbox"/> $H_1: \mu > 6.5\text{mg}$ |

A random sample of 34 sheep was selected from a large herd at Havenspread farm. Their fleece yields are normally distributed. In one week the yields, in kilograms, for each sheep are recorded. A summary of the data is given below

$$\sum x = 304.64$$

Investigate the claim that the mean weekly fleece yield for the herd is greater than 8.4lbs, using a 5% significance level.

What are the hypotheses for this test?

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| <input checked="" type="checkbox"/> $H_0: \mu = 8.4\text{lbs}$ | <input type="checkbox"/> $H_0: \mu < 8.4\text{lbs}$ | <input type="checkbox"/> $H_1: \mu = 8.4\text{lbs}$ | <input type="checkbox"/> $H_1: \mu < 8.4\text{lbs}$ |
| <input type="checkbox"/> $H_0: \mu \neq 8.4\text{lbs}$ | <input type="checkbox"/> $H_0: \mu > 8.4\text{lbs}$ | <input type="checkbox"/> $H_1: \mu \neq 8.4\text{lbs}$ | <input checked="" type="checkbox"/> $H_1: \mu > 8.4\text{lbs}$ |

A random sample of 100 workers from a packing factory were asked to take part in a trial and were timed how long it took them to pack a box using the new packing system.

Previously, it took an average of 47seconds for a worker to pack the box.

It took the sample of workers a total of 4530 seconds to pack one box each with the new method.

Assuming that this sample came from an underlying normal population, investigate the claim that the new packing system reduces the packing time, using the 5% significance level. What are the hypotheses for this test?

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| <input checked="" type="checkbox"/> $H_0: \mu = 47\text{seconds}$ | <input type="checkbox"/> $H_0: \mu < 47\text{seconds}$ | <input type="checkbox"/> $H_1: \mu = 47\text{seconds}$ | <input checked="" type="checkbox"/> $H_1: \mu < 47\text{seconds}$ |
| <input type="checkbox"/> $H_0: \mu \neq 47\text{seconds}$ | <input type="checkbox"/> $H_0: \mu > 47\text{seconds}$ | <input type="checkbox"/> $H_1: \mu \neq 47\text{seconds}$ | <input type="checkbox"/> $H_1: \mu > 47\text{seconds}$ |