

1. Jerzy measured the actual content of 32 one-gallon cans of paint and found that they contained an average of 0.95 gallons. Answer the following questions in the context of Jerzy's experiment.

What is the population here?

- ☐ A. all cans of paint
- ☐ B. all 1-gallon cans
- ☐ C. the 32 cans of paint
- ☐ D. all 1-gallon cans of paint
- ☐ E. all cans

What claim is (implicitly) being made about the population mean μ ?

- ☐ A. $\mu < 1$
- ☐ B. $\mu > 1$
- ☐ C. $\mu \leq 1$
- ☐ D. $\mu \geq 1$
- ☐ E. $\mu \neq 1$
- ☐ F. $\mu = 1$

What is μ_0 ?

- ☐ A. 1
- ☐ B. 32
- ☐ C. undefined
- ☐ D. 0.95

What is x^- ?

- ☐ A. 1
- ☐ B. undefined

- ☐ C. 0.95
- ☐ D. 32

What is Jerzy's alternative hypothesis?

- ☐ A. $\mu < 1$
- ☐ B. $\mu < 0.97$
- ☐ C. $\mu = 0.97$
- ☐ D. $\mu > 0.97$
- ☐ E. $\mu = 1$
- ☐ F. $\mu > 1$
- ☐ G. $\mu \neq 0.97$
- ☐ H. $\mu \neq 1$

What is Jerzy's null hypothesis?

- ☐ A. $\mu > 0.97$
- ☐ B. $\mu > 1$
- ☐ C. $\mu < 1$
- ☐ D. $\mu < 0.97$
- ☐ E. $\mu = 1$
- ☐ F. $\mu \neq 1$
- ☐ G. $\mu = 0.97$
- ☐ H. $\mu \neq 0.97$

2. Jesse claims that the average cartoon short is eight minutes long, but Janie disagrees and has found an average time of 8.5 minutes for a sample of 30 cartoons. Answer each of the following questions.

The population is

- ☐ A. all cartoon shorts that Jesse has seen

- ☐ B. the 30 cartoon shorts
 - ☐ C. all cartoon shorts
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The claim that Jesse is making about the population mean μ is

- ☐ A. that it is not equal to 8
 - ☐ B. that it is less than or equal to 8
 - ☐ C. that it is greater than or equal to 8
 - ☐ D. that it is equal to 8
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What is x^- ?

Which of the following is Janie's alternative hypothesis?

- ☐ A. $\mu \leq 8$
- ☐ B. $\mu = 8$
- ☐ C. $\mu \neq 8$
- ☐ D. $\mu \geq 8$

3. Note that this problem has several parts.

If $H_0: \mu \leq 5$, then

- ☐ A. $H_a: \mu \neq 5$
 - ☐ B. $H_a: \mu > 5$
 - ☐ C. $H_a: \mu = 5$
 - ☐ D. $H_a: \mu \geq 5$
 - ☐ E. $H_a: \mu < 5$
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Goes w/ #3

If $H_0: \mu=5$, then

- ☐ A. $H_a: \mu \geq 5$
 - ☐ B. $H_a: \mu < 5$
 - ☐ C. $H_a: \mu > 5$
 - ☐ D. $H_a: \mu \leq 5$
 - ☐ E. $H_a: \mu \neq 5$
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If $H_0: \mu \geq 5$, then

- ☐ A. $H_a: \mu \leq 5$
 - ☐ B. $H_a: \mu > 5$
 - ☐ C. $H_a: \mu < 5$
 - ☐ D. $H_a: \mu = 5$
 - ☐ E. $H_a: \mu \neq 5$
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If $H_a: \mu > 5$, then

- ☐ A. $H_0: \mu \geq 5$
 - ☐ B. $H_0: \mu \neq 5$
 - ☐ C. $H_0: \mu = 5$
 - ☐ D. $H_0: \mu < 5$
 - ☐ E. $H_0: \mu \leq 5$
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If $H_a: \mu < 5$, then

- ☐ A. $H_0: \mu > 5$
- ☐ B. $H_0: \mu \geq 5$
- ☐ C. $H_0: \mu = 5$

w/ #3

- ☐ D. $H_0 : \mu \leq 5$
 - ☐ E. $H_0 : \mu \neq 5$
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If $H_a : \mu \neq 5$, then

- ☐ A. $H_0 : \mu \geq 5$
 - ☐ B. $H_0 : \mu = 5$
 - ☐ C. $H_0 : \mu < 5$
 - ☐ D. $H_0 : \mu > 5$
 - ☐ E. $H_0 : \mu \leq 5$
4. Jill believes that the IQ scores of Stat 200 students have a mean of more than 100. Which of the following best symbolize her null and alternative hypotheses?
- ☐ A. $H_0 : \mu = 100$, $H_a : \mu \neq 100$
 - ☐ B. $H_0 : \mu \geq 100$, $H_a : \mu < 100$
 - ☐ C. $H_0 : \mu > 100$, $H_a : \mu \leq 100$
 - ☐ D. $H_0 : \mu < 100$, $H_a : \mu \geq 100$
 - ☐ E. $H_0 : \mu \leq 100$, $H_a : \mu > 100$
 - ☐ F. $H_0 : \mu \neq 100$, $H_a : \mu = 100$
5. Jack believes that the Bortle dark-sky score of his home city averages more than 5.0, and has collected 50 days' scores, which have a mean of 5.15. Which of the following best symbolize his null and alternative hypotheses?
- ☐ A. $H_0 : \mu \neq 5.0$, $H_a : \mu = 5.0$
 - ☐ B. $H_0 : \mu = 5.0$, $H_a : \mu \neq 5.0$
 - ☐ C. $H_0 : \mu \leq 5.0$, $H_a : \mu > 5.0$
 - ☐ D. $H_0 : \mu \neq 5.15$, $H_a : \mu = 5.15$

☐ E. $H_0 : \mu \geq 5.0$, $H_a : \mu < 5.0$

☐ F. $H_0 : \mu \leq 5.15$, $H_a : \mu > 5.15$

6. Jeremy has claimed that the average wingspan of a monarch butterfly is four inches. Jessica does not believe this, and has collected 36 butterflies with an average wingspan of 3.84 inches. Which of the following best symbolize her null and alternative hypotheses?

☐ A. $H_0 : \mu \neq 4.0$, $H_a : \mu = 4.0$

☐ B. $H_0 : \mu = 4.0$, $H_a : \mu \neq 4.0$

☐ C. $H_0 : \mu \neq 3.84$, $H_a : \mu = 3.84$

☐ D. $H_0 : \mu = 3.84$, $H_a : \mu \neq 3.84$

☐ E. $H_0 : \mu \leq 3.84$, $H_a : \mu > 3.84$

☐ F. $H_0 : \mu \geq 3.84$, $H_a : \mu < 3.84$

7. A manufacturer of breath mints has set its packaging machine to fill containers with 50 mints each, but a manager suspects that the machine is overfilling the containers. Assuming that the number of mints per container is normally distributed, what should the manager's null and alternative hypotheses be?

☐ A. $H_0 : \mu < 50$, $H_a : \mu \geq 50$

☐ B. $H_0 : \mu > 50$, $H_a : \mu \leq 50$

☐ C. $H_0 : \mu \geq 50$, $H_a : \mu < 50$

☐ D. $H_0 : \mu \leq 50$, $H_a : \mu > 50$

8. Which of the following corresponds to "x is no more than 12.2"?

☐ A. $x > 12.2$

☐ B. $x < 12.2$

☐ C. $x \geq 12.2$

☐ D. $x \leq 12.2$