

# Practice Quiz 8

Statistics 1000

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1. (10 pts.) Number of calves sired by a sample of 10 captive Beluga whales had mean 1.5. Assume population standard deviation to be 1.4.
  - (a) Set up a 95% confidence interval for the mean number of calves sired by all captive Belugas.
  - (b) Based on your confidence interval, is 3 a plausible value for mean number of calves sired?
  - (c) Suppose someone wants to test a claim that the mean number of calves sired is less than 3. State the appropriate null and alternative hypotheses.
  - (d) Calculate the standardized test statistic. \_\_\_\_\_
  - (e) Our test statistic is
    - (i) not large (ii) large (iii) borderline.
  - (f) The  $p$ -value is (i) not small (ii) small (iii) borderline.
  - (g) Which one of these is the correct conclusion?
    - i. Population mean number of calves sired is proven to be 3.
    - ii. Population mean number of calves sired is proven to be 1.5.
    - iii. Population mean number of calves sired may be 3.
    - iv. We have proven that population mean number of calves sired is less than 3.
    - v. We have compelling evidence that population mean number of calves sired is less than 3.
    - vi. Results are inconclusive.
  - (h) If the data were used to test a claim that mean number of calves sired *differs* from 3, the  $p$ -value would be
    - (i) half (ii) twice (iii) the same as the one for the test described above.
  - (i) Now suppose that 1.4 is the *sample* standard deviation; use the fact that the  $t$  multiplier for 9 degrees of freedom and 95% confidence is 2.26 to set up a confidence interval for population mean number of calves sired.
  - (j) The interval is narrower when we use the (i)  $z$  (ii)  $t$  multiplier.