# Test 3

(December 10)

Name _____

Math 125 *Kovitz* Fall 2025

Each question is worth 21 points.

1. In a certain town there are 30,000 registered voters, of whom 12,000 are Democrats. A survey organization is about to take a simple random sample of 1,000 registered voters.

   Find the chance that between 39% and 41% of the registered voters in the sample are Democrats.

   (A) 24%  (B) 42%  (C) 48%  (D) 58%  (E) 80%

2. (a) Probabilities are used when reasoning from the _____ to the _____;

   confidence levels are used when reasoning from the _____ to the _____.

   Options: box draws

   (b) The chance error is in the _____ value.

   Options: observed expected.

   (c) The confidence interval is for the _____ percentage.

   Options: sample population

**Turn over for problems 3 to 5.**

3. One hundred draws will be made at random with replacement from the box

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
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Estimate the chance that the average of the draws will be more than 4.2.

(A) 1% (B) 16% (C) 31% (D) 68% (E) 84%

4. The speed of light was measured 2,500 times. The average reading was 299,787 kilometers per second, and the SD was 11.5 kilometers per second. Assume the Gauss model, with no bias. Find a 95%-confidence interval for the speed of light.

(A) 299,786.99 to 299,787.01 (B) 299,786.77 to 299,787.23 (C) 299,786.54 to 299,787.46
(D) 299,775.5 to 299,798.5 (E) 299,764 to 299,810

5. A coin is tossed 6400 times, resulting in 3300 heads. Someone tells you that it is a fair coin.

Use the sample data to assess whether or not this claim is credible and indicate your conclusion below.

Clearly choose your null and alternative hypotheses, set up a box model, and run a test of hypotheses. You should base your conclusion on the results of that test. Decide whether the claim is credible or not credible.

Answer with the value of $P$ and the decision.

(A) $P = 1\%$, not credible (B) $P = 1\%$, credible (C) $P = 11\%$, credible
(D) $P = 21\%$, credible (E) $P = 31\%$, credible