

Math 1501 - Elements of Statistics with Applications

1.1-1.2 Recap — Practice Questions - Aligns with Homework 1

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On the midterms, you will be graded heavily on your thinking process and showing your work, rather than getting full marks *from only a correct answer*. Today's recap section will serve as practice for the exams.

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I will not provide extensions if you miss it - see syllabus.

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The Enrollment key: Fall2026

End of announcements

We will begin our practice questions.

Descriptive or inferential statistics? — item 1

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Descriptive — the use of the statistic stops at the sample it was calculated from. The statistic(s) calculated is/are not inferring about a more general population.

Descriptive or inferential statistics? — item 2

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Inferential — the statistics generated are used beyond the clinics actually studied and sampled.

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Or is that statistic being used to make an inference about a different, broader set of data — one that was not actually measured?

That's inferential.

Practice: probability

A drawer holds 34 blue socks, 41 black socks, and 25 white socks, all mixed together. You reach in and grab one sock without looking.

Find $P(\text{black})$. Round your answer to three decimal places.

Probability — setting up the fraction

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$$P(\text{event}) = \frac{\text{what you want}}{\text{everything there is}}$$

Probability — the answer, and the rule

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The denominator is always the total count of everything you could have drawn — never the number of categories you sorted them into.

Probability — a common mistake

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The denominator has to be 100 — the total number of socks you could have actually grabbed. Dividing by 3 instead answers a completely different question: “out of the 3 colors, what share does black make up?” That is *not* what $P(\text{black})$ is asking.

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And 13.7 isn't even a valid probability — it's already outside $[0, 1]$. That mismatch alone should tell you something went wrong, before you check anything else.

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This is not a suggestion. Check every probability answer against this rule before you submit it.

Practice: What is the sample, parameter, population, statistic

A university has 12,400 students. Exactly 38% of all students are the first in their family to attend college. Administrators randomly survey 150 students; 54 of those surveyed turn out to be first-generation students.

- 1 What do the 12,400 students represent?
- 2 What does the 38% represent?
- 3 What do the 150 surveyed students represent?
- 4 What does 54/150 represent?

Population, sample, parameter, statistic — the answer, and the rule

1. Population
2. Parameter
3. Sample
4. Statistic

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Whole group → population/parameter. Just the ones measured → sample/statistic.

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A parameter is fixed and usually unknown. A statistic is computed from your data — it's your best estimate of the parameter, and it changes every time you resample.

Classify each of these items

So far: qualitative, quantitative, discrete, continuous

- 1 Your blood type
- 2 Number of emails in your inbox
- 3 Time to walk to campus, in minutes
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If you can count the items using whole numbers (on your fingers) without needing fractions, then what you're counting is discrete.

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Otherwise, if you need fractions or decimals to count your observation, then it is considered "continuous".