

Quiz 1

URBAN 520: Quantitative Methods in Urban Design and Planning

Time: 30 minutes | Total: 20 points | October 13, 2026 | Name: _____

Question 1 True or False

(4 points)

No explanation needed for these questions.

- A. (2 points) To estimate the share of Seattle workers who commute by transit, a student stands outside the U District light rail station on a weekday morning and asks 100 people how they get to work. 85% say transit.
1. The population is the 100 people the student asked. _____
 2. If the student asked 3,000 people at the same station instead, the result would be a good estimate of the citywide share. _____
- B. (2 points) Five randomly selected Seattle residents report commute times of 10, 20, 30, 40, and 50 minutes, so $\bar{y} = 30$. An analyst computes the sample variance.

$$s^2 = \frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y})^2 = \frac{(-20)^2 + (-10)^2 + 0^2 + 10^2 + 20^2}{5-1} = \frac{1,000}{4} = 250$$

1. $s^2 = 250$ is an estimate of the variance of commute times of all Seattle residents based on the data. _____
2. If the five numbers were the commute times of all five members of a city council, and you want to describe these five people, you should still divide by $n - 1$. _____

Question 2 Short Answer

(6 points)

These questions should be answered briefly (in a few sentences).

- A. (3 points) A survey asks residents how safe they feel walking at night: 1 = very unsafe, 2 = unsafe, 3 = neutral, 4 = safe, 5 = very safe. Five residents answered in each of two neighborhoods:
- Neighborhood A: 1, 1, 2, 5, 5 (mean = 2.8)
 - Neighborhood B: 2, 3, 3, 3, 3 (mean = 2.8)

A planner concludes that residents of A and B feel equally safe because the two means are equal. What is wrong with this reasoning? What would you report instead?

- B. (3 points) In October 2026, a planner wants to map how the population of every census block in Seattle changed from 2016 to 2026, using American Community Survey data. Name two potential issues with this plan, and we encourage you to think of more.

Question 3 Short Essay Question

(10 points)

In public policy-making, numbers are often viewed as symbols of objective rationality. Briefly explain why "numbers" in public policy are also inherently political.

Quiz 1*

URBAN 520: Quantitative Methods in Urban Design and Planning

Time: 30 minutes | Total: 20 points | October 15, 2026 | Name: _____

Question 1 True or False

(4 points)

- A. (2 points) To estimate the share of Seattle workers who commute by transit, a student stands outside the U District light rail station on a weekday morning and asks 100 people how they get to work. 85% say transit.
1. The population is the 100 people the student asked. _____
 2. If the student asked 3,000 people at the same station instead, the result would be a good estimate of the citywide share. _____
- B. (2 points) Data source.
1. The 2024 ACS 5-year estimates describe the period 2020–2024, not the year 2024 alone. _____
 2. A planner downloads the assessed value of every parcel in Seattle from the King County Assessor and computes their mean. This *mean* is a statistic that estimates the mean assessed value of all Seattle parcels. _____

Question 2 Short Answer

(6 points)

These questions should be answered briefly (in a few sentences).

- A. (3 points) A neighborhood is made up of three census tracts.

Tract	Households	Households that rent
A	3,000	60%
B	1,000	20%
C	1,000	20%

What percent of all households in the neighborhood rent? Provide your brief calculation.

- B. (3 points) To build a housing burden index for Seattle's census tracts, a planner uses the sum of two indicators for each tract: the poverty rate (in percent) and the median rent (in dollars). What is wrong with this index? How would you fix it?

Question 3 Short Essay Question

(10 points)

Wachs (1989, *When Planners Lie with Numbers*) argues that planners are trapped between two roles: the “scientist” and the “advocate.” What is your understanding of these two roles? How would you connect the conflict between the two roles to the idea from Stone (1988, *Policy Paradox*) that numbers are inherently political?