

Week 7 — First-half synthesis: Wednesday exit ticket

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Name: _____

Date: _____

Instructions

Work through each item below. Write your final response in the space provided. Show enough work that another reader can follow your reasoning.

1. A regional public-health team compiled data from 96 mid-sized US counties on the number of community **walking-trail miles per 1,000 residents** (x) and the county's **adult obesity rate** (y , percent of adults). The dataset is observational and county-level.

The scatter trends **downward** (more walking-trail miles is associated with a lower county obesity rate) and is moderately tight. The reported correlation is $r \approx -0.52$.

- (a) Identify the **cases**, the **explanatory variable**, and the **response variable** in this study. State whether each variable is numerical or categorical.
- (b) Was this an observational study or an experiment, and what scope of inference does the design support? Answer in one or two sentences.
- (c) In two short sentences, describe the **direction, form, and strength** of the association between walking-trail miles and obesity rate. Treat the correlation as the descriptive summary it is.
- (d) The team also reports that **median household income** in each county is moderately negatively correlated with the obesity rate ($r \approx -0.48$) and moderately positively correlated with walking-trail miles per 1,000 residents ($r \approx +0.44$). Using the words **alone** and **after accounting for income**, predict how the walking-trails vs obesity association is likely to change inside narrow income strata.
- (e) **Early modeling preview** (no mechanics). Next week we will fit a line to a scatter like the one in (c). Just based on the description above, would the slope of that fitted line be **positive, negative, or roughly zero**? Give a one-sentence reason. Do **not** estimate a slope value.