Solutions

2.1

- Minutes: quantitative, ratio (zero = no time).
- Hour: categorical, ordinal.
- Rider code: categorical, nominal.
- Satisfaction: categorical, ordinal (ordered ratings).

2.2

- (b) random 200: unbiased, and n gives the ± 1.
- (a) systematic is near-random unless orders cycle in tens.
- (c) convenience: nearest orders are systematically faster – biased at any size.

2.3

- Non-response bias (with selection inside the response).
- Frequent orderers are over-represented.
- Satisfaction is biased toward loyal customers' view – state the direction, report the rate.

2.4

- The 37-case mean is defensible.
- Zero-filling invents three instant deliveries and drags the mean down by 1.9.
- The report must state the missingness and its likely direction (busy-runs forgotten $\rightarrow$ true mean likely a little higher).

2.5

- (a) False – size multiplies bias.
- (b) True – proportional allocation needs strata sizes (or estimates).
- (c) True – the population is defined by the claim you want to make.