

1. Find the density for frequency 30 and class width 10.

2. For $t=8+2d$, find t at $d=5$.

3. Find the mean of 2,4,4,6,9.

4. Find the residual if observed $t=21$ and predicted $t=18$.

5. Find the median of 2,4,4,6,9.

6. A high correlation permits reliable extrapolation to any distance.

☐ True ☐ False
7. A histogram bar’s height always equals its frequency, even with unequal class widths.

☐ True ☐ False
8. The model $t=8+2d$ fits observed journey times. An observed 21 minutes against a predicted 18 means what?

☐ A residual of +3 minutes: the model under-predicted this observation

☐ The model is exact

☐ The observation must be discarded
9. In a histogram with unequal class widths, which bar contains the most observations?

☐ Always the widest bar

☐ The one with the largest AREA, not necessarily the tallest

☐ Always the tallest bar
10. For $t=8+2d$, find the predicted time when $d=7$.

1. **3.0**

Density=frequency/class width= $30/10=3$.
2. **18.0**

Substitute distance 5: $8+2\times5=18$ minutes.
3. **5.0**

The total is 25 across five observations: mean= $25/5=5$.
4. **3.0**

Residual=observation-prediction= $21-18=3$ minutes.
5. **4.0**

The sorted list is 2,4,4,6,9. Its third observation is 4.
6. **False**

A good fit does not prove a causal mechanism. A correlation coefficient measures linear association, not the gradient. Calculator output must be translated into a model, checked and interpreted.
7. **False**

The tallest histogram bar need not contain the most observations. A grouped mean is an estimate. Correlation does not prove causation, and extrapolation extends beyond the observed range.
8. **A residual of +3 minutes: the model under-predicted this observation**

Residual = observed - predicted = $21-18 = 3$. Residuals reveal systematic model weakness; a good fit on average can still hide poor regions.
9. **The one with the largest AREA, not necessarily the tallest**

Histogram area equals frequency. A wide bar of low density can hold more observations than a narrow tall bar; height alone shows density, not frequency.
10. **22.0**

Substitute $d=7$: $t=8+2\times7=22$ minutes.