

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. With unequal class widths the height is frequency density.

☐ True ☐ False

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

- ☐ The model is exact, so the 3-minute gap must be a measurement error
☐ The observation should be discarded because it does not fit the model
☐ A residual of +3 minutes: the model under-predicted this observation

9. In a histogram with unequal class widths, which bar contains the most observations?

- ☐ Always the widest bar, because a wider class must contain more values
☐ The one with the largest AREA, not necessarily the tallest
☐ Always the tallest bar, because height shows how many observations it holds

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: $8+2\times 5=18$ 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 model fitted to data is reliable only near that data; extrapolating far outside it is unreliable.

7. **True**

True. With unequal class widths the height is frequency density; frequency is the area of the bar.

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