LESSON MAKER PRO

Bell Curve Check

Use percentages and shape to judge a data set.

HIGH SCHOOL · MT.PLUS.DATA.NORM.1

MT.PLUS.DATA.NORM.1 "Determine if a data set is normally distributed."

NAME _____ DATE _____

WHAT TO CHECK

In an approximately normal data set, about 68% of values fall within 1 standard deviation of the mean, and about 95% fall within 2. The data should also have one peak and be roughly symmetric.

WORKED EXAMPLE

The mean is 59.5 and the standard deviation is 10. Do these 50 values look approximately normal?

VALUES BY INTERVAL

Interval	Count	Interval	Count
30-39	1	60-69	17
40-49	7	70-79	7
50-59	17	80-89	1

1. Within 1 standard deviation: 17 + 17 = 34; 34/50 = 68%.
2. Within 2 standard deviations: 7 + 17 + 17 + 7 = 48; 48/50 = 96%.
3. The counts rise to the middle, then fall symmetrically.

Answer: Yes, the data look approximately normal.

PRACTICE 4 problems

1 Of 100 values, 68 are within 1 standard deviation and 95 are within 2. The data have one peak and are roughly symmetric. Approximately normal?

ANSWER _____

2 Of 100 values, 40 are within 1 standard deviation and 70 are within 2. Approximately normal?

ANSWER _____

3 Of 200 values, 136 are within 1 standard deviation and 190 are within 2. The data have one peak and are roughly symmetric. Approximately normal?

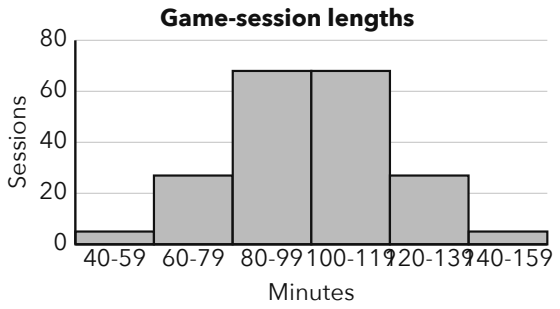
ANSWER _____

4 Of 100 values, 90 are within 1 standard deviation and 95 are within 2. Approximately normal?

ANSWER _____

APPLY IT Show your work

1 A gaming club records 200 game-session lengths. The mean is 99.5 minutes, and the standard deviation is 20 minutes. Do the lengths look approximately normal?



ANSWER _____

2 An online shop records 100 order totals. The mean is $75, and the standard deviation is $20. Only 40 totals are within 1 standard deviation, and 70 are within 2. Do the totals look approximately normal?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A set of 100 commute times has 68 values within 1 standard deviation and 95 within 2. But 75 values are above the mean. Does the set look approximately normal? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Bell Curve Check

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Of 100 values, 68 are within 1 standard deviation and 95 are within 2. The data have one peak and are roughly symmetric. Approximately normal?	**Yes.**
2	Of 100 values, 40 are within 1 standard deviation and 70 are within 2. Approximately normal?	**No.**
3	Of 200 values, 136 are within 1 standard deviation and 190 are within 2. The data have one peak and are roughly symmetric. Approximately normal?	**Yes.**
4	Of 100 values, 90 are within 1 standard deviation and 95 are within 2. Approximately normal?	**No.**

PART 2 · APPLY IT

1. **Yes, the lengths look approximately normal.** Within 1 standard deviation are 136/200 = 68%; within 2 are 190/200 = 95%. The histogram is roughly symmetric with one peak.
2. **No, the totals do not look approximately normal.** The counts are 40% and 70%, well below the normal benchmarks of about 68% and 95%.

CHALLENGE

No. The percentages match, but 75 values above the mean and 25 below it do not suggest a roughly symmetric distribution.

Accept "consistent with an approximately normal distribution" for yes answers. The percentage benchmarks alone are not enough when the data are not roughly symmetric.