

Algebra 2 - The Normal Distribution - Quiz

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Name: _____ Class: _____ Date: ____/____/____

Answer ten multiple-choice questions on the normal distribution. Choose one option for each question, then read the explanation to see why the correct choice works and which mistake, such as confusing standard deviations with percents, each wrong choice shows.

Algebra 2 · Common Core State Standards: **S-ID.A.4**

Questions

Question 1

In a normal distribution, about what percent of data lie within 2 standard deviations of the mean?

- A. 95%
- B. 68%
- C. 99.7%
- D. 50%

Question 2

A score of 90 with mean 78 and standard deviation 4 has a z-score of

- A. 12
- B. 3
- C. 0.33
- D. -3

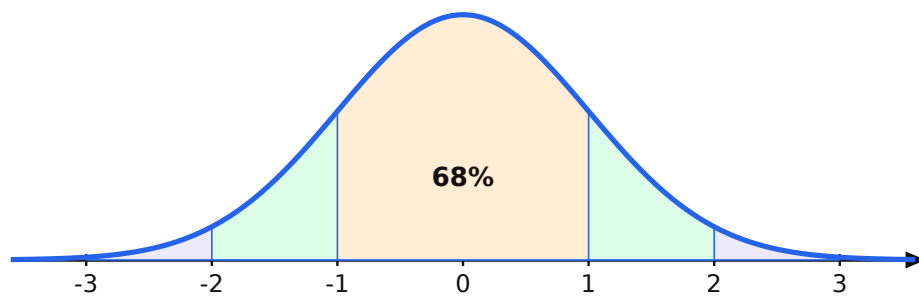
Question 3

A z-score of -2 means the value is

- A. 2 standard deviations below the mean
- B. 2 below the mean
- C. 2% below the mean
- D. 2 standard deviations above the mean

Question 4

95% within 2 sd; 99.7% within 3 sd



The 68-95-99.7 rule: z-scores from -3 to 3.

According to the diagram, what percent of data lie within 1 standard deviation of the mean?

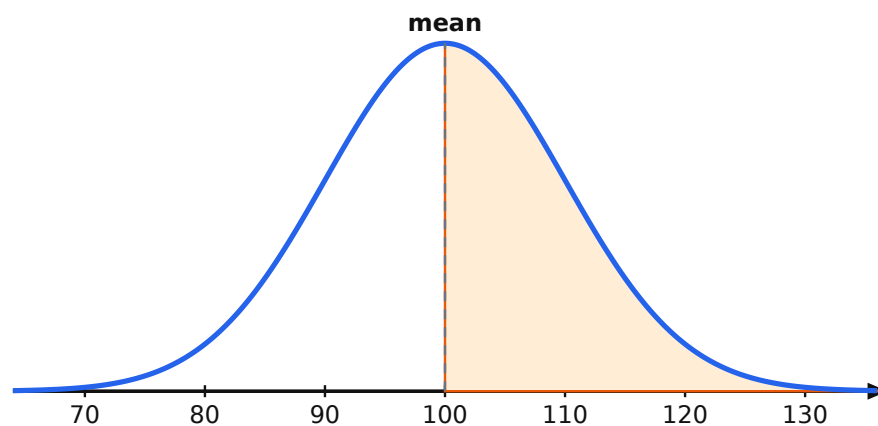
- A. 95%
- B. 34%
- C. 99.7%
- D. 68%

Question 5

Scores have mean 50 and standard deviation 8. What score has $z = 1.5$?

- A. 62
- B. 58
- C. 65
- D. 12

Question 6



Right half of the curve.

What proportion of a normal distribution is above the mean?

- A. 0.68
- B. 0.34
- C. 0.5
- D. 1

Question 7

Test A: score 82, mean 70, sd 6. Test B: score 88, mean 80, sd 8. Which statement is correct?

- A. Test B is better because 88 is greater than 82
- B. They are equal
- C. Test B is better because the sd is larger
- D. Test A is better because $z = 2$ compared with $z = 1$

Question 8

About what percent of a normal distribution is more than 3 standard deviations above the mean?

- A. 0.3%
- B. 0.15%
- C. 5%
- D. 2.5%

Question 9

z	-1	0	1	2
Area below z	0.159	0.500	0.841	0.977

Standard normal areas.

Use the table to find the proportion between $z = -1$ and $z = 1$.

- A. 0.841
- B. 0.318
- C. 0.682
- D. 0.159

Question 10

Which describes a normal distribution?

- A. Skewed to the right
- B. Symmetric and bell shaped with mean at the center
- C. Flat with equal heights
- D. Two separate peaks

Answers

1. **A** - The 68-95-99.7 rule: 95% within 2 standard deviations.
2. **B** - $z = (90 - 78) / 4 = 3$.
3. **A** - The sign shows the direction and the number counts standard deviations.
4. **D** - The center region marked 68% is the data within one standard deviation.
5. **A** - $x = 50 + 1.5 \cdot 8 = 62$.
6. **C** - The normal curve is symmetric, so half of the area is above the mean.
7. **D** - z-scores: $A = (82 - 70)/6 = 2$ and $B = (88 - 80)/8 = 1$, so A is higher relative to its class.
8. **B** - 99.7% are within 3 sd, leaving 0.3% in both tails, so 0.15% in the upper tail.
9. **C** - $0.841 - 0.159 = 0.682$.
10. **B** - A normal distribution is symmetric and bell shaped, with the mean, median, and mode at the center.

Remember

- Normal distribution: symmetric, bell-shaped, described by its mean and standard deviation.
- 68-95-99.7 rule for 1, 2, 3 standard deviations.
- $z = (x - \text{mean}) / \text{sd}$ and $x = \text{mean} + z \text{ times sd}$.
- Area under the curve = proportion of data.
- Compare different distributions with z-scores.