

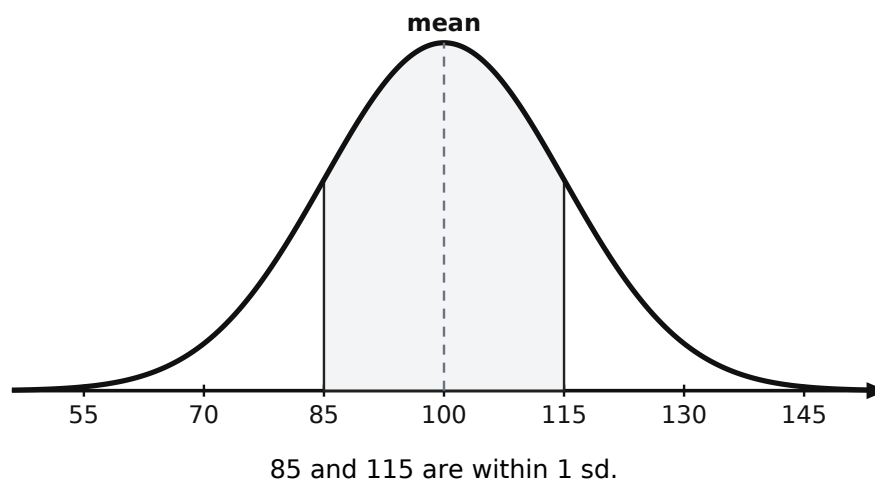
Algebra 2 - The Normal Distribution - Test Answer Key

Common Core S-ID.A.4 · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the test on the normal distribution (S-ID.A.4). Each solution shows the full reasoning, and the scoring note explains how many points to award for correct setup, correct work, and a correct final answer. Partial credit rewards a sound method even when a small arithmetic slip changes the result.

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

Question 1 - Empirical rule [2 pts]



85 and 115 are 1 standard deviation from 100: 68%. 70 and 130 are 2 standard deviations away: 95%.

About 68% and about 95%

Scoring: 1 point for each percent.

Question 2 - z-score [2 pts]

$$z = \frac{24-30}{4} = -1.5.$$

z = -1.5: 1.5 standard deviations faster (below) the mean

Scoring: 1 point for the z-score, 1 point for the interpretation.

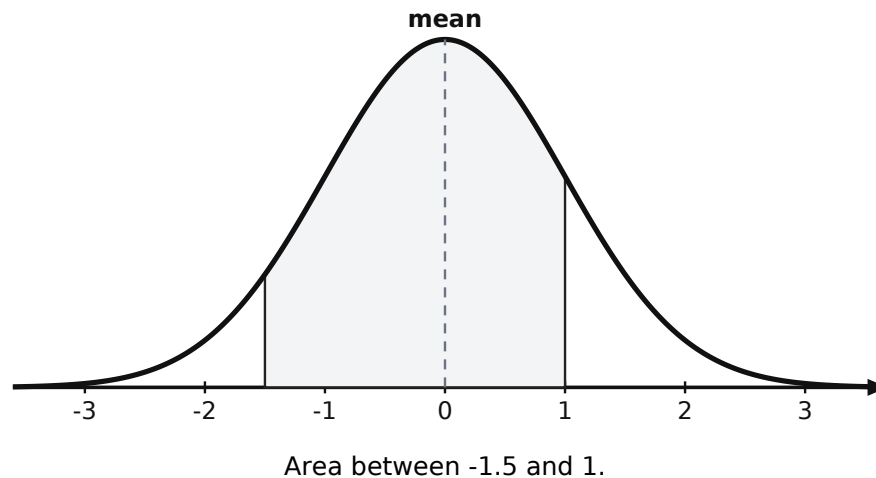
Question 3 - Compare [3 pts]

Aisha: $z = \frac{91-80}{5} = 2.2$. Ethan: $z = \frac{96-85}{8} = 1.375$.

Aisha

Scoring: 1 point for each z-score, 1 point for the conclusion.

Question 4 - Area between [3 pts]



$P(Z < 1) = 0.8413$ and $P(Z < -1.5) = 0.0668$.

Subtract: $0.8413 - 0.0668 = 0.7745$.

About 77.5%

Scoring: 1 point for each area, 1 point for the difference.

Question 5 - Percent above [2 pts]

$z = \frac{69-64}{2.5} = 2$. $P(Z > 2) = 0.0228$.

About 2.3%

Scoring: 1 point for the z-score, 1 point for the percent.

Question 6 - Find the value [2 pts]

$$x = 500 + (-0.5)(80) = 460.$$

460

Scoring: 1 point for the formula, 1 point for the value.

Question 7 - Count [2 pts]

$$z = \frac{78-70}{4} = 2. \text{ About 2.5\% of values lie above (0.0228).}$$

$$500 \cdot 0.0228 \approx 11.$$

About 11 packages

Scoring: 1 point for the z-score, 1 point for the count.

Question 8 - Percentile [2 pts]

$$x = 60 + 0.84(10) = 68.4.$$

About 68.4

Scoring: 1 point for the formula, 1 point for the value.

Question 9 - Find the error [2 pts]

The 95% figure belongs to 2 standard deviations. Within 1 standard deviation lies about 68% of the data.

68%

Scoring: 1 point for the correct percent, 1 point for the explanation.

Total**20 points**