

AP Statistics - z-Scores and the Normal Distribution - Test Answer Key

Common Core AP STAT 1.10, AP STAT 1.11, HSS-ID.A.4 · maths-pdf.fr/en/

Each solution includes a scoring guide. Award points for the correct z-score, the correct area, and the sentence that answers the question in context.

AP Statistics · Common Core State Standards: **AP STAT 1.10, AP STAT 1.11, HSS-ID.A.4**

Question 1 - z-scores [3 pts]

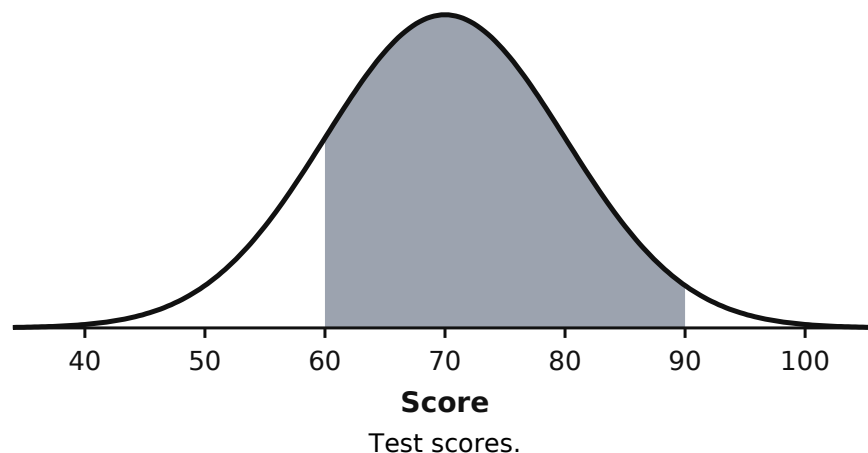
(a) $z = \frac{88-70}{10} = 1.8$. (b) $70-5 = 65$.

(c) The score is 1.8 standard deviations above the mean.

1.8; 65; above the mean by 1.8 sd.

Scoring: 1 point per part.

Question 2 - Normal area [3 pts]



$z = -1$ and $z = 2$. $0.9772 - 0.1587 = 0.8186$.

0.8186.

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

Question 3 - Empirical rule [2 pts]

600 is 2 standard deviations above the mean. 95% are within 2, so 5% outside, and 2.5% above.

About 2.5%.

Scoring: 1 point for $z = 2$, 1 point for 2.5%.

Question 4 - Percentile [3 pts]

For area 0.80, $z = 0.84$. $x = 70 + 0.84(10) = 78.4$.

About 78.4: 80% of scores are at or below 78.4.

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

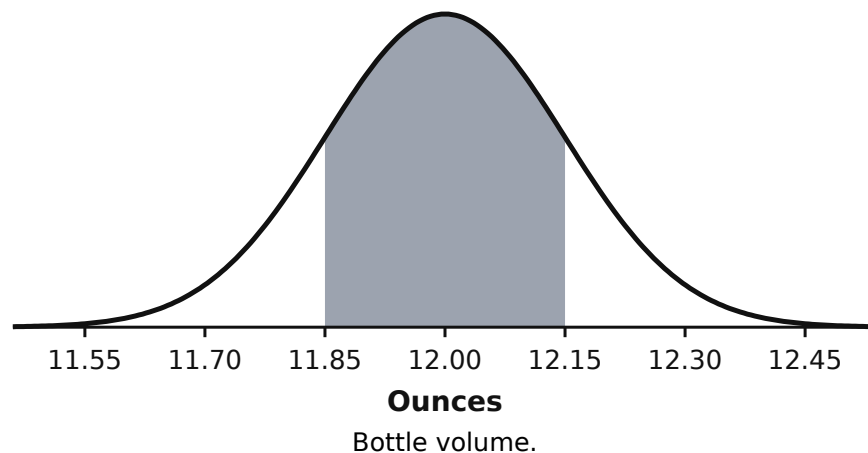
Question 5 - Compare scores [2 pts]

Priya: $z = 1.3$. Diego: $z = \frac{27-21}{4.5} = 1.33$.

Diego ($z = 1.33$ compared with 1.30).

Scoring: 1 point for each z-score and 1 for the conclusion, 2 points total with partial credit.

Question 6 - Counts from the rule [2 pts]

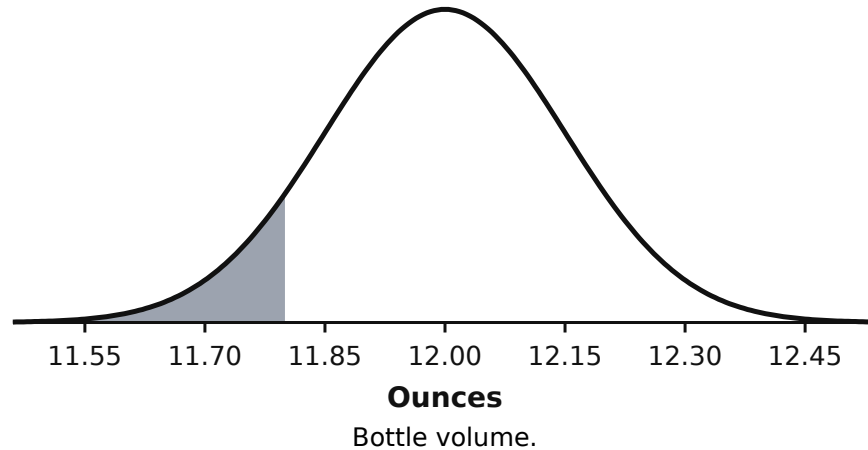


These limits are 1 sd from the mean, so about 68%: $0.68 \times 800 = 544$.

About 544 bottles.

Scoring: 1 point for 68%, 1 point for 544.

Question 7 - Rejection rate [3 pts]



$$z = \frac{11.8 - 12}{0.15} = -1.33. \quad P(Z < -1.33) = 0.0918.$$

0.0918.

Scoring: 1 point for z , 1 point for the sketch or setup, 1 point for 0.0918.

Question 8 - Unit change [2 pts]

Mean $150(0.4536) = 68.04$, sd $20(0.4536) = 9.07$.

68.04 kg and 9.07 kg; z-scores do not change.

Scoring: 1 point for the two values, 1 point for the z-score statement.

Total

20 points