

Algebra 2 - The Normal Distribution - Worksheet

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

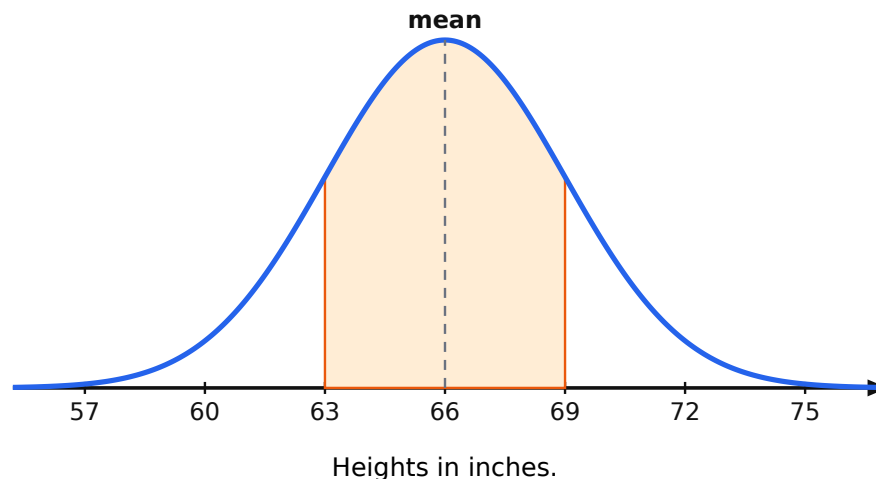
Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice the normal distribution (Common Core S-ID.A.4). The first problems check the 68-95-99.7 rule and z-scores, the middle problems add areas under the normal curve and comparing scores, and the last six are word problems and multi-step tasks that need counts, percentiles, and quality-control decisions.

Work in order and show every step. Write each answer in simplest form, and open the answer key only after you have tried the problem yourself.

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

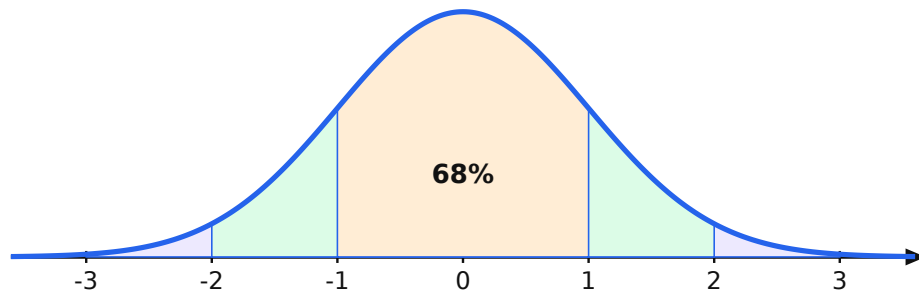
Exercise 1 - Within one standard deviation



Heights of eighth graders are approximately normal with mean 66 inches and standard deviation 3 inches. About what percent are between 63 and 69 inches?

Exercise 2 - Within two standard deviations

95% within 2 sd; 99.7% within 3 sd

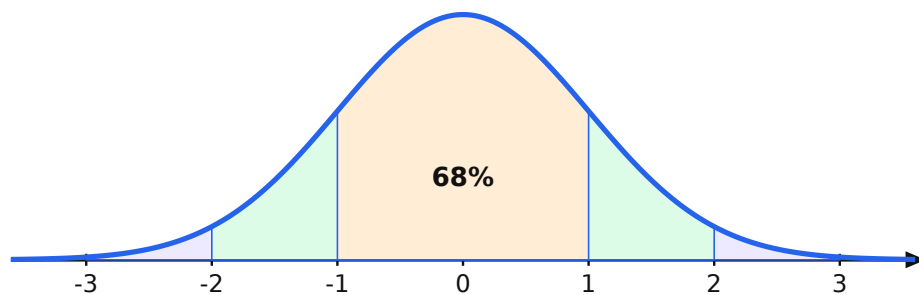


The 68-95-99.7 rule: z-scores from -3 to 3.

Using the same distribution (mean 66, standard deviation 3), what percent are between 60 and 72 inches?

Exercise 3 - Tail percent

95% within 2 sd; 99.7% within 3 sd



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

Using mean 66 and standard deviation 3, what percent are taller than 75 inches?

Exercise 4 - Compute a z-score

A test has mean 72 and standard deviation 6. Find the z-score of a score of 84.

Exercise 5 - Negative z-score

A test has mean 70 and standard deviation 10. Find the z-score of 55 and interpret it.

Exercise 6 - From z to a value

Scores have mean 500 and standard deviation 100. What score has a z-score of 1.2?

Exercise 7 - Compare two tests

Maya scored 88 on a test with mean 80 and standard deviation 4. Jamal scored 85 on a test with mean 72 and standard deviation 6. Who did better relative to their class?

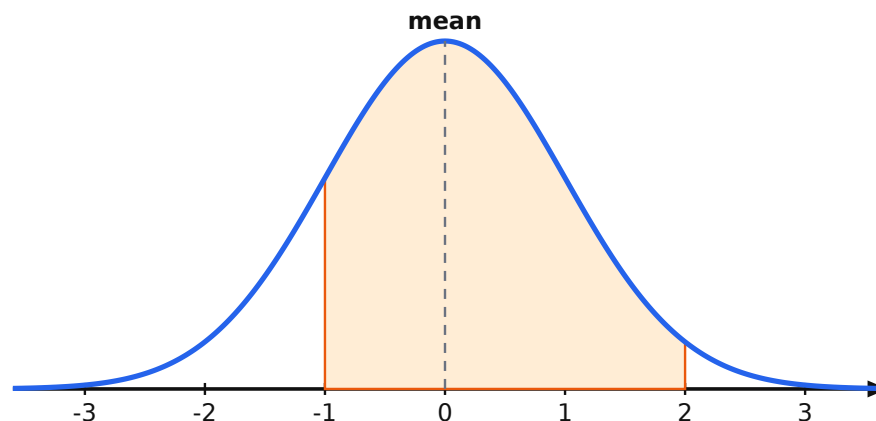
Exercise 8 - Area below $z = 1$

Find the proportion of a normal distribution below $z = 1$.

Exercise 9 - Area above $z = 1.5$

Find the proportion above $z = 1.5$.

Exercise 10 - Area between



Standard normal curve.

Find the proportion of a normal distribution between $z = -1$ and $z = 2$.

Exercise 11 - Percent below a score

Scores on an entrance exam are approximately normal with mean 1050 and standard deviation 200. What percent score below 1250?

Exercise 12 - Percent above a score

Using the same exam (mean 1050, standard deviation 200), what percent score above 1400?

Exercise 13 - Percent between two scores

What percent of exam scores (mean 1050, standard deviation 200) are between 900 and 1200?

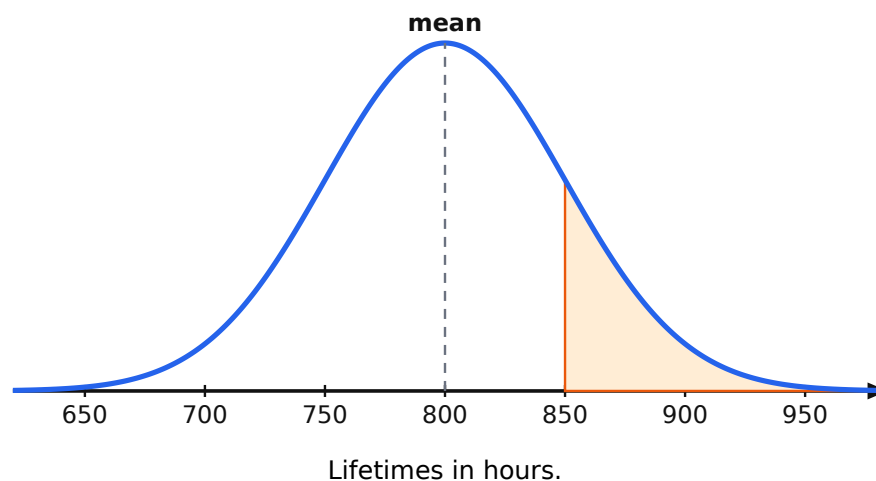
Exercise 14 - Percentile

What score is at the 90th percentile of the exam (mean 1050, standard deviation 200)? The z-score for the 90th percentile is about 1.28.

Exercise 15 - Light bulbs

The lifetimes of light bulbs are approximately normal with mean 800 hours and standard deviation 50 hours. What fraction last less than 700 hours?

Exercise 16 - How many bulbs?



Of 2,000 bulbs from the same distribution (mean 800, standard deviation 50), about how many last more than 850 hours?

Exercise 17 - Bottle filling

A machine fills bottles with mean 16.0 ounces and standard deviation 0.1 ounce. Bottles outside 15.7 to 16.3 ounces are rejected. What percent are rejected, and how many of 4,000 bottles?

Exercise 18 - Mean and standard deviation

Find the mean and population standard deviation of 4,6,8,10,12. Then find the z-score of 12.

Exercise 19 - Is a normal model reasonable?

A class of 25 students has quiz scores with mean 78 and standard deviation 5. Seventeen students scored between 73 and 83. Does this fit a normal model?

Exercise 20 - Find the error

Priya says a z-score of 2 means the value is 2% above the mean. Explain the mistake.