LESSON MAKER PRO

Curve Area Counts

Turn normal-curve areas into population percentages.

HIGH SCHOOL · AII-S.ID.4.b

AII-S.ID.4.b "If appropriate, determine population percentages using a graphing calculator for an appropriate normal curve."

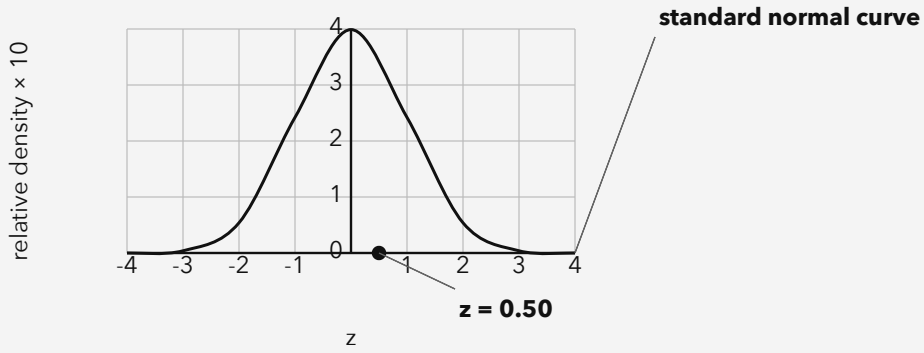
NAME _____ DATE _____

FROM AREA TO PERCENT

Use normalcdf(lower, upper, mean, SD) to find an area under a normal curve. Multiply the decimal by 100 for a percent, and subtract from 1 when you need the area to the right.

WORKED EXAMPLE

The figure shows a standard normal curve. What percent of values are below the marked z = 0.50?



1. Use lower bound -1E99 and upper bound 0.50.
2. Enter normalcdf(-1E99, 0.50, 0, 1).
3. The calculator gives 0.6915.
4. Multiply by 100.

Answer: 69.15%

PRACTICE 4 problems

1 A normal model has mean 60 and standard deviation 5. A calculator gives normalcdf(-1E99, 65, 60, 5) = 0.8413. What percent of the population is below 65?

ANSWER _____

2 A normal model has mean 80 and standard deviation 4. A calculator gives normalcdf(-1E99, 72, 80, 4) = 0.0228. What percent is above 72?

ANSWER _____

3 A calculator gives normalcdf(45, 55, 50, 5) = 0.6827. What percent of the population is from 45 to 55?

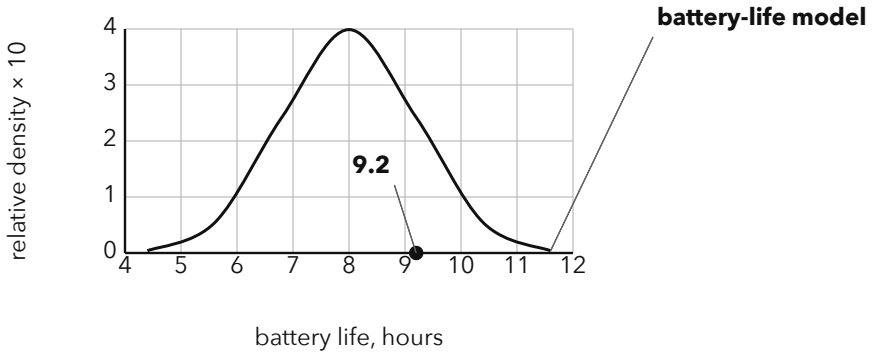
ANSWER _____

4 A normal model has mean 40 and standard deviation 10. A calculator gives normalcdf(-1E99, 52, 40, 10) = 0.8849. What percent is at least 52?

ANSWER _____

APPLY IT Show your work

1 Laptop battery life is normally modeled with mean 8 hours and standard deviation 1.2 hours. The graph shows the model. A calculator gives normalcdf(-1E99, 9.2, 8, 1.2) = 0.8413. What percent of laptops last less than 9.2 hours?



ANSWER _____

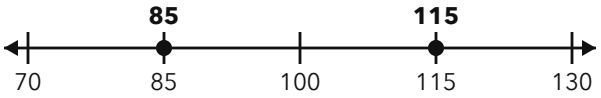
2 A music app models daily listening time with mean 46 minutes and standard deviation 9 minutes. A calculator gives normalcdf(37, 55, 46, 9) = 0.6827. What percent of users listen from 37 to 55 minutes each day?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A fitness app models weekly workout minutes with mean 100 and standard deviation 15. The number line marks 85 and 115. A calculator gives P(X < 85) = 0.1587 and P(X < 115) = 0.8413. What percent of users are outside the range from 85 to 115 minutes? Explain how you used the two tails.



WORK SPACE AND ANSWER

Curve Area Counts

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A normal model has mean 60 and standard deviation 5. A calculator gives normalcdf(-1E99, 65, 60, 5) = 0.8413. What percent of the population is below 65?	**84.13%**
2	A normal model has mean 80 and standard deviation 4. A calculator gives normalcdf(-1E99, 72, 80, 4) = 0.0228. What percent is above 72?	**97.72%**
3	A calculator gives normalcdf(45, 55, 50, 5) = 0.6827. What percent of the population is from 45 to 55?	**68.27%**
4	A normal model has mean 40 and standard deviation 10. A calculator gives normalcdf(-1E99, 52, 40, 10) = 0.8849. What percent is at least 52?	**11.51%**

PART 2 · APPLY IT

1. **84.13%** Convert the calculator area 0.8413 to a percent by multiplying by 100.
2. **68.27%** The calculator area is the probability of being in the stated interval. Multiply 0.6827 by 100.

CHALLENGE

31.74%. The left tail is 15.87%, and the right tail is 100% - 84.13% = 15.87%. Add the two tails.

Accept equivalent decimal forms, such as 0.8413 for 84.13%, when the student clearly identifies the population percentage. Accept answers rounded to the nearest hundredth percent.