## **Normal Distribution Challenges!**

3) 1 standard deviation below the mean

is Normal?!

4) 2 standard deviations below the mean

A set of data with a mean of 45 and a standard deviation of 8.3 is normally distributed. Find each value, given its distance from the mean.

1) 1 standard deviation above the mean
2) 3 standard deviations above the mean

5) Label the x-axis at 1, 2, and 3 standard deviations from the mean for each normal distribution.



6) A set of data has a normal distribution with a mean of 5.1 and a standard deviation of 0.9. Find the percent of data within each interval.



7. The average milk production of California cows follows a Normal distribution with a mean of 70 lbs and a standard deviation of 13 lbs. One particular cow produces 90 lbs of milk.

- a) Find this cow's z-score.
- b) What percent of cows produce less than this cow?
- c) What is the probability of selecting a cow that produces more than this cow?

## Study the two graphs below

A standardized normal distribution has a mean of zero and a standard deviation of 1. Here's an example, where the vertical line representing BMI=30 (left) is shown on the standardized distribution with Z = 0.16667 (right). The area to the **left** of Z = 0.16667 can be expressed as P(Z < 0.16667).



Use Table A on page 3 to look up the given probabilities: shorturl.at/fGIK2

- 1. P (z > 1) =
- 2. P(z < -2) =
- 3. P(-1 < z < 1) =
- 4. P(z > 3) =

6. Use the **normalcdf** feature of your calculator to find the probabilities. A complete solution should have: (i) Graph of normal distribution labeled and area shaded (ii) Notation that communicates what you are finding (iii) Indicate the mean, standard deviation, lower bound and upper bound clearly. You must label the statistics in your calculator syntax!!

- a) mean = 40; standard deviation = 6, find the probability that a value is greater than 45.
- b) mean = 100; standard deviation = 11.3, find the probability that a value is less than 98.
- c) mean = 50; standard deviation = 4, find the probability that a value is between 48 and 52.
- d) mean = 22; standard deviation = 4, find the probability that a value is less than 20 or greater than 24