GRAPHS AND STATISTICS: Normal Distributions – 100%

The question may require you to determine the percent of a normal distribution within a given interval. The question may be in terms of probability instead of percent.

The scores on a collegiate mathematics readiness assessment are approximately normally distributed with a mean of 680 and a standard deviation of 120.
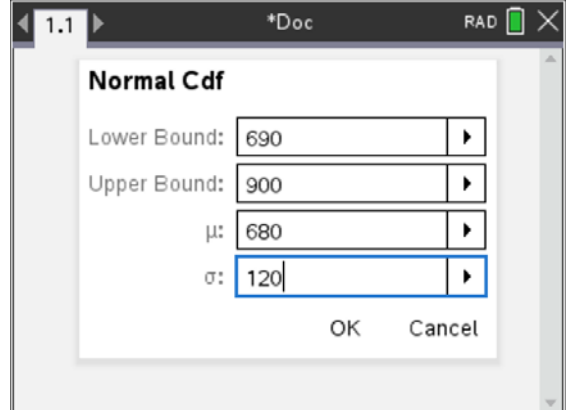
Determine the percentage of scores between 690 and 900, to the *nearest percent*.

012328aii

Add a Calculator page. Enter menu, 5, 5, 2 to bring up this wizard. Enter 690 as the Lower Bound, 900 as the Upper Bound, 680 as the mean, u, and 120 as the standard deviation, σ.	**1.1** ▶ *Doc RAD ▢ ✕ **Normal Cdf** Lower Bound: 690 ▶ Upper Bound: 900 ▶ μ: 680 ▶ σ: 120 ▶ OK Cancel
To determine a value, as required by this question, you must show the calculator input, such as by writing the information on either screen. 43 is the correct response.	**1.1** ▶ *Doc RAD ▢ ✕ normCdf(690,900,680,120) 0.43
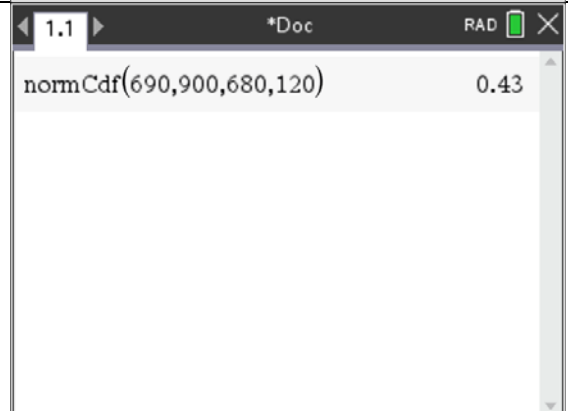
Some questions have no stated Lower Bound.

The distribution of the diameters of ball bearings made under a given manufacturing process is normally distributed with a mean of 4 cm and a standard deviation of 0.2 cm. What proportion of the ball bearings will have a diameter less than 3.7 cm?

(1) 0.0668

(3) 0.8664

(2) 0.4332

(4) 0.9500

081711aii

Add a Calculator page. Enter menu, 5, 5, 2 to bring up this wizard. Enter 0 as the Lower Bound, 3.7 as the Upper Bound, 4 as the mean, u, and 0.2 as the standard deviation, σ.	**1.1** *Doc RAD ☒ **Normal Cdf** Lower Bound: 0 ▸ Upper Bound: 3.7 ▸ μ: 4 ▸ σ: 0.2 ▸ OK Cancel
(1) is the correct response. If this were an open ended question, you must show the calculator input, such as by writing the information on either screen.	**1.1** *Doc RAD ☒ normCdf$(0,3.7,4,0.2)$ 0.07 0.06680722872027

Some questions have no stated Upper Bound.

The mean intelligence quotient (IQ) score is 100, with a standard deviation of 15, and the scores are normally distributed. Given this information, the approximate percentage of the population with an IQ greater than 130 is closest to

(1) 2%   (3) 48%

(2) 31%   (4) 95%

081919aii

Add a Calculator page. Enter menu, 5, 5, 2 to bring up this wizard. Enter 130 as the Lower Bound, 250 as the Upper Bound, 100 as the mean, u, and 15 as the standard deviation, σ. I chose a value $10u$ above the mean as the Upper Bound.	**1.1** *Doc RAD ☒ **Normal Cdf** Lower Bound: 130 ▸ Upper Bound: 250 ▸ μ: 100 ▸ σ: 15 ▸ OK Cancel

(1) is the correct response. If this were an open ended question, you must show the calculator input, such as by writing the information on either screen.	◀ 1.1 ▶ *Doc RAD ▯ ✕ normCdf(130,250,100,15) 0.02 ▸

Some questions require you to use the percentage to make a prediction.

The heights of the 3300 students at Oceanview High School are approximately normally distributed with a mean of 65.5 inches and a standard deviation of 2.9 inches. The number of students at Oceanview who are between 64 and 68 inches tall is closest to

(1) 1660   (3) 2244

(2) 1070   (4) 1640   062214aii

Add a Calculator page. Enter menu, 5, 5, 2 to bring up this wizard. Enter 64 as the Lower Bound, 68 as the Upper Bound, 65.5 as the mean, u, and 2.9 as the standard deviation, σ. Multiply the result by the population. (1) is the correct response. If this were an open ended question, you must show the calculator input, such as by writing the information on the screen.	◀ 1.1 ▶ DC RAD ▯ ✕ normCdf(64,68,65.5,2.9) 0.50 0.50318144422914· 3300 1660.50

Other questions require you to remember that in a normal distribution, about 95% of values fall within two standard deviations of the mean and about 68% of values fall within one standard deviation of the mean.

For more questions, go to https://www.jmap.org/htmlstandard/S.ID.A.4.htm.