

**Introduction to Statistics and Data Analysis**  
**Chapter 7 – The Normal Distribution:**  
***normalcdf & invNorm***

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HEY! Read this section first.

Find the probability distributions menu on your calculator:

TI-83/84     **2nd** [DISTR]

TI-89         Go to the Stat/List Editor, then press DISTR (F5)

There are three choices involving the normal distribution

normalpdf( $x, \mu, \sigma$ )

    Gives the height of the curve at  $x$ . NOT a probability.

NOTE: NEVER use normalpdf

★ normalcdf(*lowerbound, upperbound,  $\mu, \sigma$* )

    Computes the probability  $P(\text{lowerbound} < X < \text{upperbound})$

★ TI-83/84: invNorm( $p, \mu, \sigma$ )

TI-89: Inverse Normal (NOTE: Area is  $p$ )

    Computes the 100<sup>th</sup> percentile of  $X$

    (e.g., using 0.25 for  $p$  will give the 25<sup>th</sup> percentile of  $X$ )

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Now give it a try! Suppose  $X \sim N(25, 8)$ .

1. Find  $P(17 < X < 23)$ .

2. Find  $P(X < 10)$ .

HINT: The lower bound for this probability is  $-\infty$ . The TI-83/84 don't recognize  $-\infty$ , so use a very negative number instead, e.g.  $-10000$ .

3. Find  $P(X > 32)$ .

HINT: The upper bound is  $\infty$ . The TI-83/84 don't recognize  $\infty$ , so use a very positive number instead, e.g.  $10000$ .

4. Find the 10<sup>th</sup> percentile of  $X$ .

Ready for more?

Let  $X \sim N(0,1)$ .

1. Find  $P(X < 0)$
2. Find  $P(-1 < X < 1)$
3. Find  $P(-2 < X < 2)$
4. Find  $P(-3 < X < 3)$

Are these probabilities familiar? They are used in the \_\_\_\_\_ Rule.

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One more time!

Suppose IQ scores are normally distributed with a mean of 100 and a standard deviation of 15.

1. What is the probability that a person has an IQ score greater than 120?
2. What is the probability that a person has an IQ score between 110 and 130?
3. What is the 90<sup>th</sup> percentile of IQ scores?
4. 2% of IQ scores are above \_\_\_\_\_. (HINT: What percentile is this?)