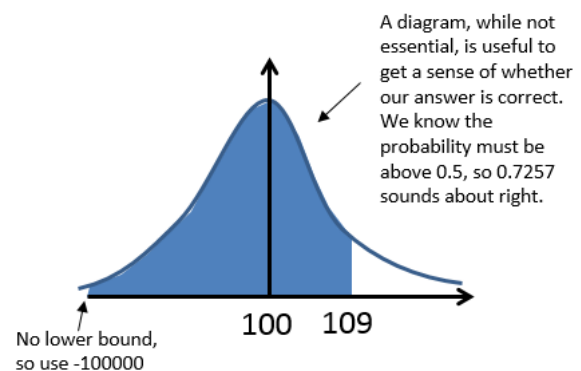# Getting normal values from your calculator

IQ is distributed using $X \sim N(100,15^2)$. Find
(a) $P(X < 109)$
(b) $P(X \geq 93)$
(c) $P(110 < X < 120)$
(d) $P(X < 80 \text{ or } X > 106)$

1. Press MODE.
2. Choose DISTRIBUTION (option 7)
3. Choose Normal CD (i.e. "Cumulative Distribution")
4. Since the lower value is effectively $-\infty$, use any value at least 5σ below the mean (-100000 will do!). Press = after each value.
5. Put the upper value as 109.
6. Set $\sigma = 15$ and $\mu = 100$
7. You should obtain $P(X < 109) = 0.7257 \ (4dp)$

A diagram, while not essential, is useful to get a sense of whether our answer is correct. We know the probability must be above 0.5, so 0.7257 sounds about right.

100 109

No lower bound, so use -100000

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Test Your Understanding

The criteria for joining Mensa is an IQ of at least 131.

Assuming that IQ has the distribution $X \sim N(100, 15^2)$ for a population, determine:

a) What percentage of people are eligible to join Mensa.

b) If 30 adults are randomly chosen, the probability that at least 3 of them will be eligible to join. (Hint: Binomial distribution?)