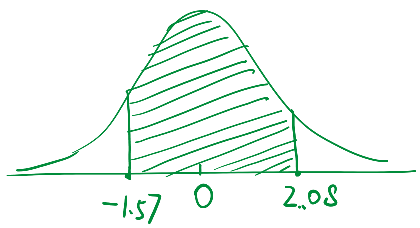
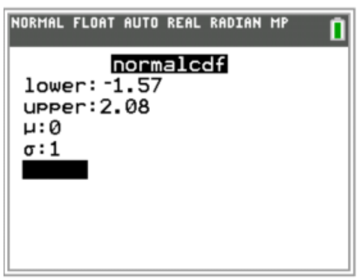
I. iii. Cont.

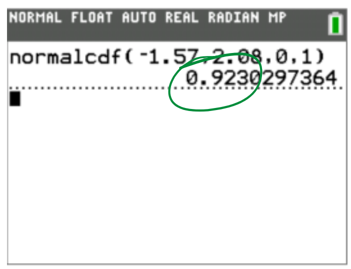
eg. Find $P(-1.57 < z < 2.08)$.

S:

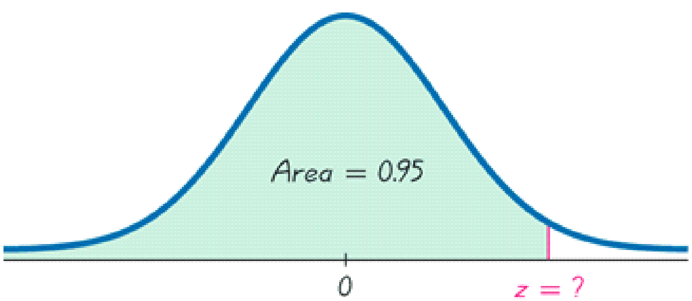




→



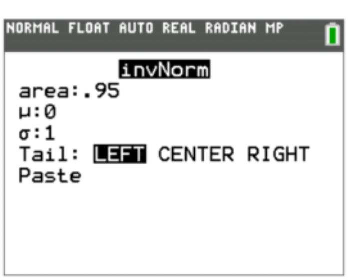
eg.



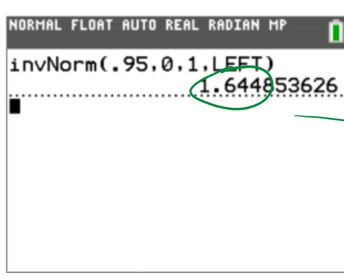
← P = 0.95 is given

← ask for z-score

TI-84: 2nd → distr → 3: invNorm(



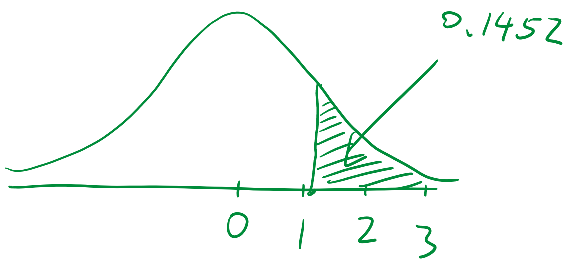
→



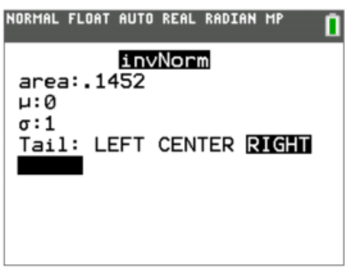
$z = \boxed{1.64}$

* older version of TI-84 is left tail by default.

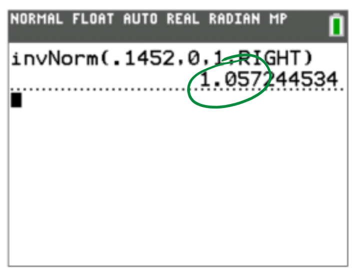
eg Find the z-score:



S:

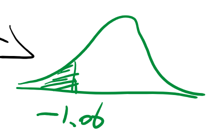


→



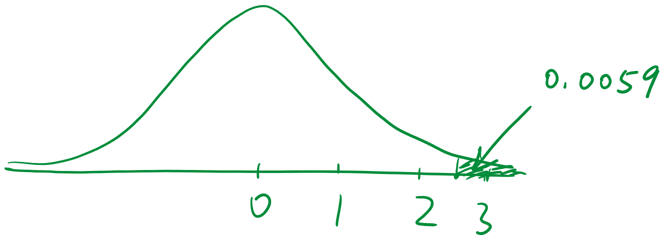
$z \approx \boxed{1.06}$

Older TI-84: $z \approx -1.06$ is left tail's

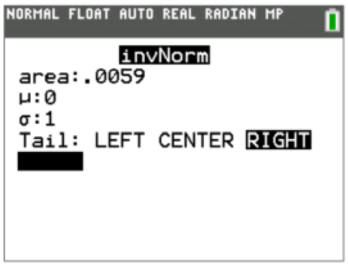


but right tail's $z \approx \boxed{1.06}$, because of symmetry.

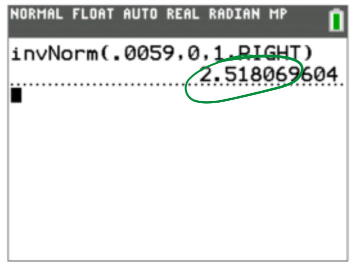
eg Find the z-score:



S:



→



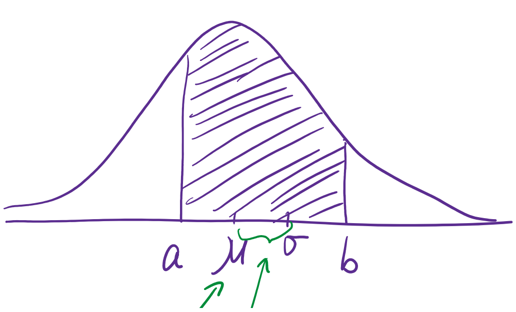
$$Z \approx \boxed{2.52}$$

Older TI-84: $Z \approx -2.52$ from left tail,

$$\Rightarrow Z = \boxed{2.52}$$

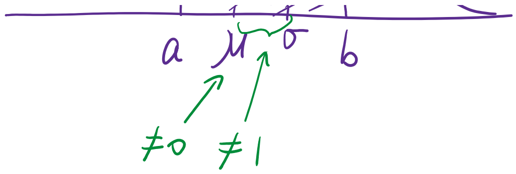
II. Normal Distribution (Regular)

When we work with Normal Distribution Applications, we have to deal with any non-standard ($\mu \neq 0$, $\sigma \neq 1$), N.D.. That is, the mean μ is no longer 0, or σ is no longer 1.



$$Z = \frac{x-\mu}{\sigma}$$

⟶

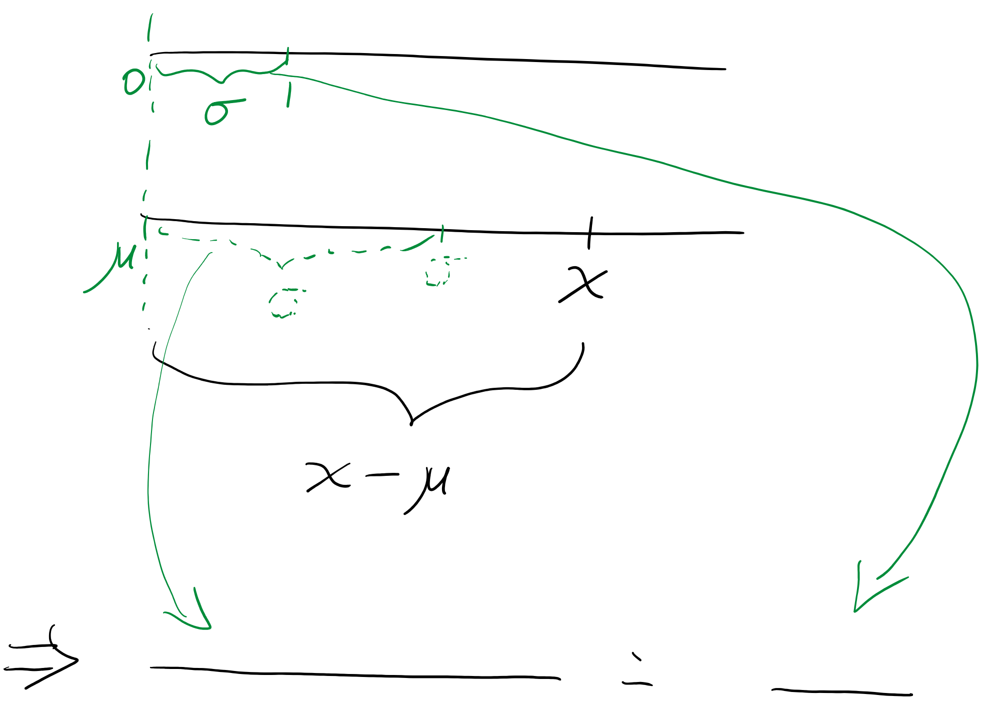


⇒ Table (discontinued)

Thus, the conversion (from the old-days) is

$$\boxed{z = \frac{x-\mu}{\sigma}}$$

Graph approach:



$$= x - \mu \div \sigma$$

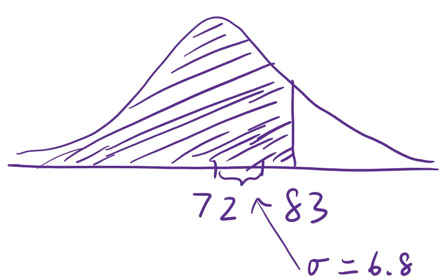
$$= \ldots -3, -2, -1, 0, 1, 2, 3, \ldots$$

$= \boxed{\text{z-score from the table}}$

* Don't use it.

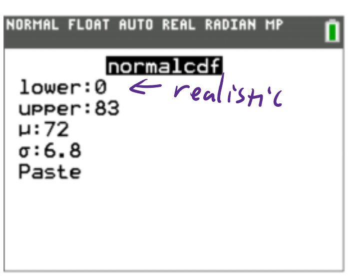
TI-84: $\boxed{\text{change } \mu = 0,\ \sigma = 1}$

eg Find the probability below:

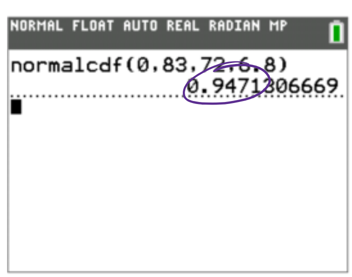


← Exam scores

S: $\mu = 72, \quad \sigma = 6.8$

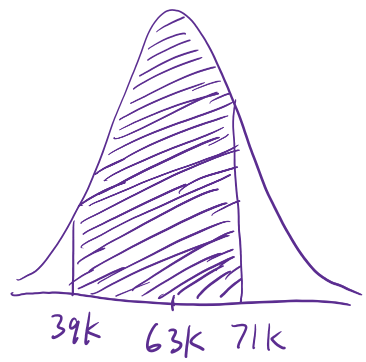


→



$P \approx \boxed{0.95}$

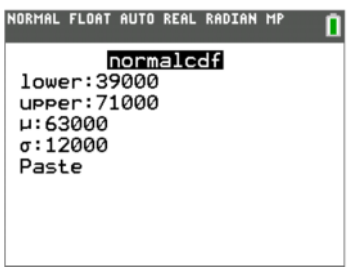
eg Find the probability below :



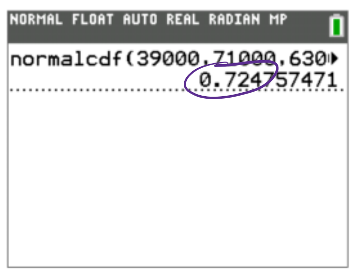
← salary

$\mu = 63k, \quad \sigma = 12k$

S:



→

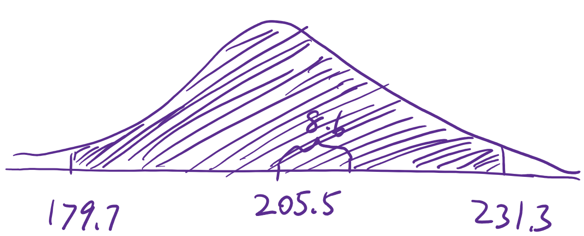


$P \approx \boxed{0.72}$

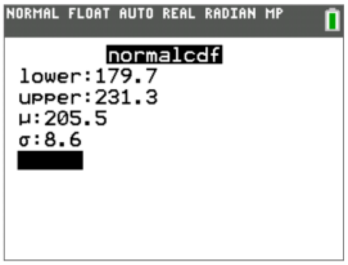
eg Given that the overhead reach distances of adult females: μ = 205.5 cm, σ = 8.6 cm, and overhead reach distances are normally distributed. The overhead reach distances are used in planning assembly work stations. If an adult female is randomly selected, find the probability that her overhead reach is between 179.7 cm and 231.3 cm.

S:

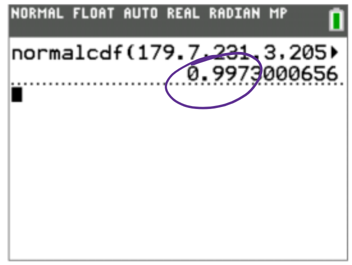
← draw this every time



$\mu = 205.5, \quad \sigma = 8.6$



→



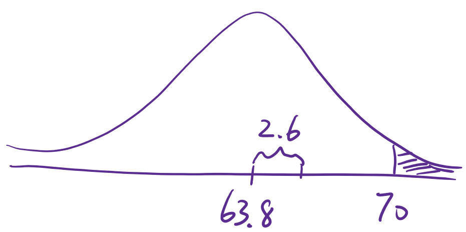
$P \approx \boxed{0.9973}$

$\geq$

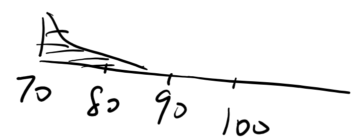
equals or more

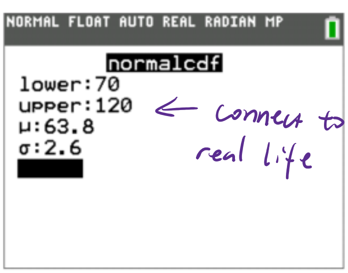
eg Tall Clubs International has a requirement that women must be at least 70 inches tall. Given that women have normally distributed heights with a mean of 63.8 inches and a standard deviation of 2.6 inches, find the percentage of women who satisfy that height requirement.

S:



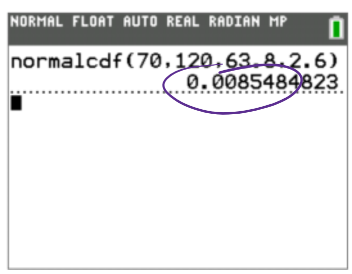
real life:





connect to real life

→



$P \approx \boxed{0.0085}$

given

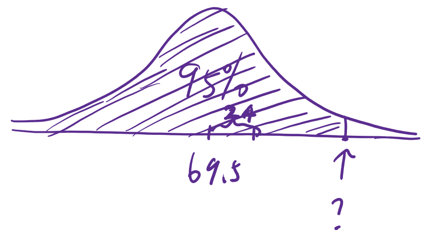
eg When designing aircraft cabins, what ceiling height will allow 95% of men to stand without bumping their heads? Men's heights are normally distributed with a mean of 69.5 inches and a standard deviation of 2.4 inches.

S:

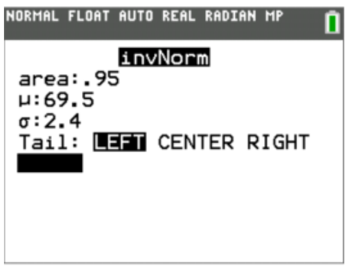
ask for x

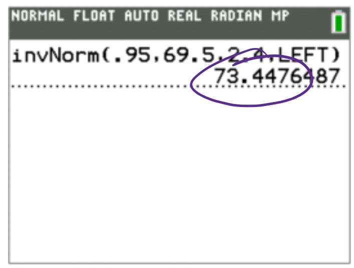
S:

ask for x



$$\mu = 69.5, \quad \sigma = 2.4, \quad P = 95\% = 0.95$$





height $= \boxed{73.4}$ inches