TI–84+ Lab 11 For Mathematics 224

Topics: normal distribution

Normal Distribution. Normal densities of IQ scores for 16 year olds, Y_1, and 20 year olds, Y_2, are given by

$$\begin{aligned} f(y_1) &= \frac{1}{16\sqrt{2\pi}} e^{-(1/2)[(y-100)/16]^2}, \\ f(y_2) &= \frac{1}{20\sqrt{2\pi}} e^{-(1/2)[(y-120)/20]^2}. \end{aligned}$$

- For the sixteen year old normal distribution, where $\mu = 100$ and $\sigma = 16$,

$$P(Y_1 < 84) = \int_{-\infty}^{84} \frac{1}{16\sqrt{2\pi}} e^{-(1/2)[(y-100)/16]^2}\, dy_1 \approx 0.1587$$

  - 2nd DISTR 2:normalcdf(− 2nd EE 99, 84, 100, 16)
  - Notice the normalcdf function has four arguments: normalcdf(low, high, μ, σ). In this case, the "low" number is "− 2nd EE 99" and approximates negative infinity. The "high" number is 84. Finally, this is a nonstandard normal, where the μ and σ are 100 and 16, respectively.

- $P(Y_1 < 100) = 0.5$
  2nd DISTR 2:normalcdf(− 2nd EE 99, 100, 100, 16)

- $P(84 < Y_1 < 100) \approx 0.3413$
  2nd DISTR 2:normalcdf(84, 100, 100, 16)

- For the *twenty* year old normal distribution, where $\mu = 120$ and $\sigma = 20$,
  $P(84 < Y_2 < 100) \approx 0.1227$
  2nd DISTR 2:normalcdf(84, 100, 120, 20)