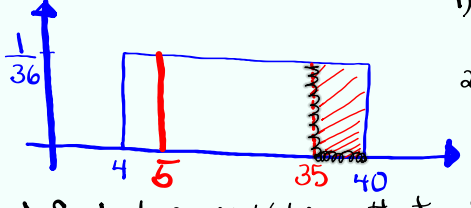
Statistics

Lecture 18

Feb 19-8:47 AM

Consider a uniform Prob. dist. for allves from 4 to 40.



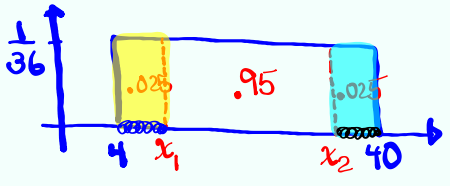
1) $P(x=5) = 0$

2) $P(x>35) = (40-35)\cdot\frac{1}{36} = \boxed{\frac{5}{36}}$

3) Find two x-values that separete the middle 95% from the rest.

$1-.95 = .05$

$.05 \div 2 = .025$



$(x_1-4)\cdot\frac{1}{36} = .025$

$x_1 - 4 = 36(.025)$

$x_1 - 4 = .9$

$\boxed{x = 4.9}$

$(40-x_2)\cdot\frac{1}{36} = .025$

$40 - x_2 = 36(.025)$

$40 - x_2 = .9$

$\boxed{x_2 = 30.1}$

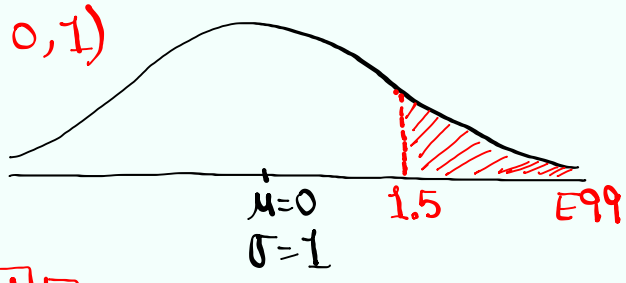
May 4-9:57 AM

Find $P(Z > 1.5)$

= normalcdf(1.5, E99, 0, 1)

2nd [ ]

$\approx$ .067

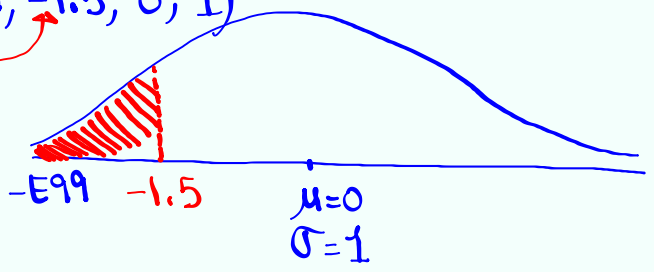


$P(Z < -1.5)$ 2nd [ ]

= normalcdf(−E99, −1.5, 0, 1)

(−)

$\approx$ .067

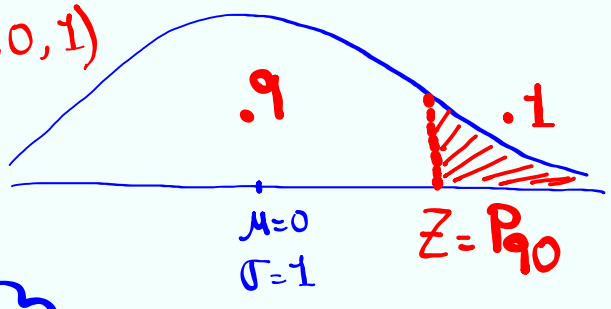


May 4-10:08 AM

Find a Z-value that separates the top 10% from the rest.

$Z = P_{90}$ = invNorm(.9, 0, 1)

$\approx$ 1.282



SG 17

May 4-10:16 AM

Normal Prob. Dist.: (SG 18)

1) We use x, $P(x=c)=0$

2) Graph of the dist. is symmetric, bell-shape with total area 1.

3) Mean = Mode = Median

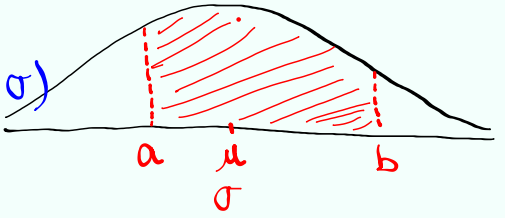
4) μ & σ are given in the problem.

$P(a<x<b)$ is the Corresponding area within the graph.

$N(\mu,\sigma)$

Use TI

normalcdf(L, U, μ, σ)



May 4-10:22 AM

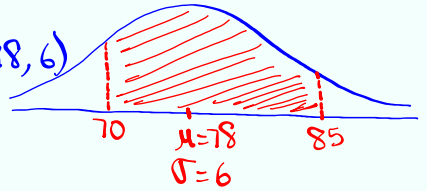
Given $N(78, 6)$ (μ = 78, σ = 6)

Normal Prob. Dist.

$P(70<x<85)$

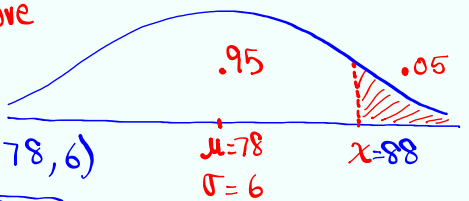
= normal cdf(70, 85, 78, 6)

$\approx$ .787



Find $x = P_{95}$, Round to whole #.

95% below, 5% above



x = invNorm(.95, 78, 6)

$\approx 87.869 \approx$ 88

May 4-10:28 AM

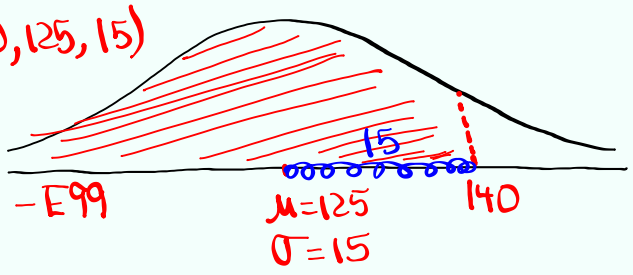
Consider a normal Prob. dist. with the mean of 125 and standard deviation of 15.

$N(125, 15)$

1) $P(x < 140)$

= normalcdf(-E99, 140, 125, 15)

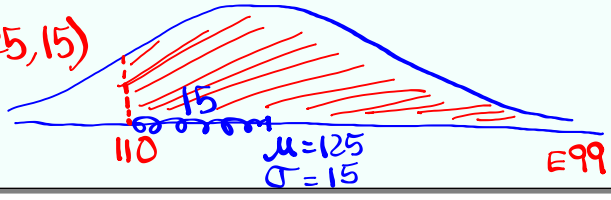
$\approx$ .841



2) $P(x > 110)$

= normalcdf(110, E99, 125, 15)

$\approx$ .841



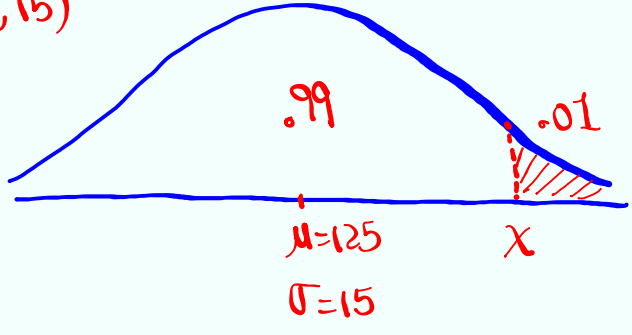
May 4-10:36 AM

3) Find $x = P_{99}$, round to whole #

x = invNorm(.99, 125, 15)

= 159.895

$\approx$ 160



May 4-10:43 AM

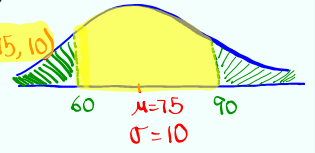
Exam scores are normally dist. with mean of 75 and standard deviation of 10. $N(75, 10)$

If one exam is randomly selected, find the Prob. that its Score (x) is below 60 or above 90.

$P(x<60 \text{ or } x>90)$

$= 1 - P(60 < x < 90)$

$= 1 - \text{normalcdf}(60, 90, 75, 10)$



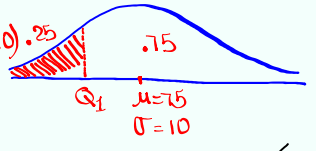
$\approx .134$

Find $x = Q_1$

$x = \text{invNorm}(.25, 75, 10)$

$= 68.255$

≈ 68



SG 18 ✓

May 4-10:46 AM

Clear all lists.

Store 2, 4, 6, and 8 in L1.

Use 1-Var Stats with L1 only to find

$\mu = \bar{x} = 5$ $\quad \sigma = \sigma_x = 2.236$ $\quad \sigma^2 = \sigma_x^2 = 5$

VARS | 5: Statistics | 4: σ_x | x^2 | Enter

take all Samples of Size 2 with replacement from this list.

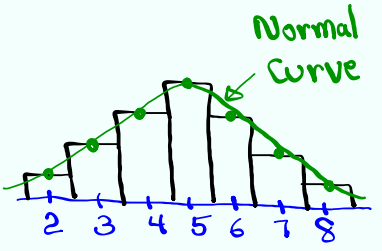
				Find $\bar{x}$ of each Sample			
2,2	2,4	2,6	2,8	2	3	4	5
4,2	4,4	4,6	4,8	3	4	5	6
6,2	6,4	6,6	6,8	4	5	6	7
8,2	8,4	8,6	8,8	5	6	7	8

May 4-10:58 AM

2	3	4	5
3	4	5	6
4	5	6	7
5	6	7	8

$\bar{x}$	$P(\bar{x})$
2	1/16
3	2/16
4	3/16
5	4/16
6	3/16
7	2/16
8	1/16

Prob. dist. histogram



$\bar{x} \rightarrow$ L2 , $P(\bar{x}) \rightarrow$ L3

use 1-Var Stats with L2 & L3

$\mu = 5$ $\sigma = 1.581$ $\sigma^2 = \frac{5}{2}$

Do Same Process with
2, 4, 6, 8, and 10

May 4-11:06 AM