$$\frac{47-41}{73-41} = \frac{6}{32} = 0.187$$

standard Normal distribution

standardizing

$$\frac{65-41}{32} =$$

$$\frac{73-41}{73-41} -$$

$$41-41$$

$$X = \frac{(x-\mu)}{\sigma}$$

→ Z-Scores

Marks (X)	$(x-\mu)$	$(x-\bar{x})^2$	$\frac{x-\bar{x}}{\sigma}$
47	−10	100	
65	+8	64	
73	+16	256	
41	−16	256	
58	+1	1	

$\mu = 57$

?

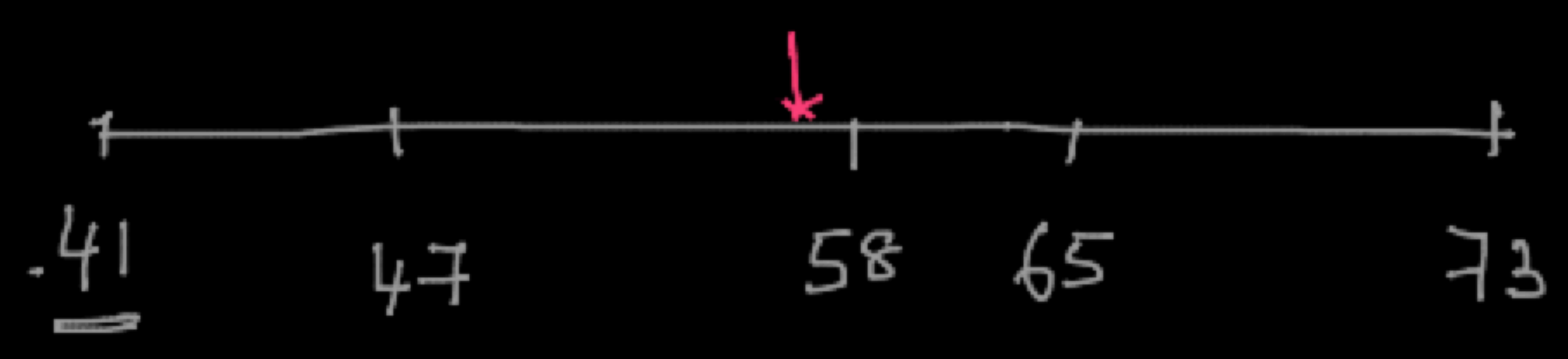
135.5

$\sigma =$

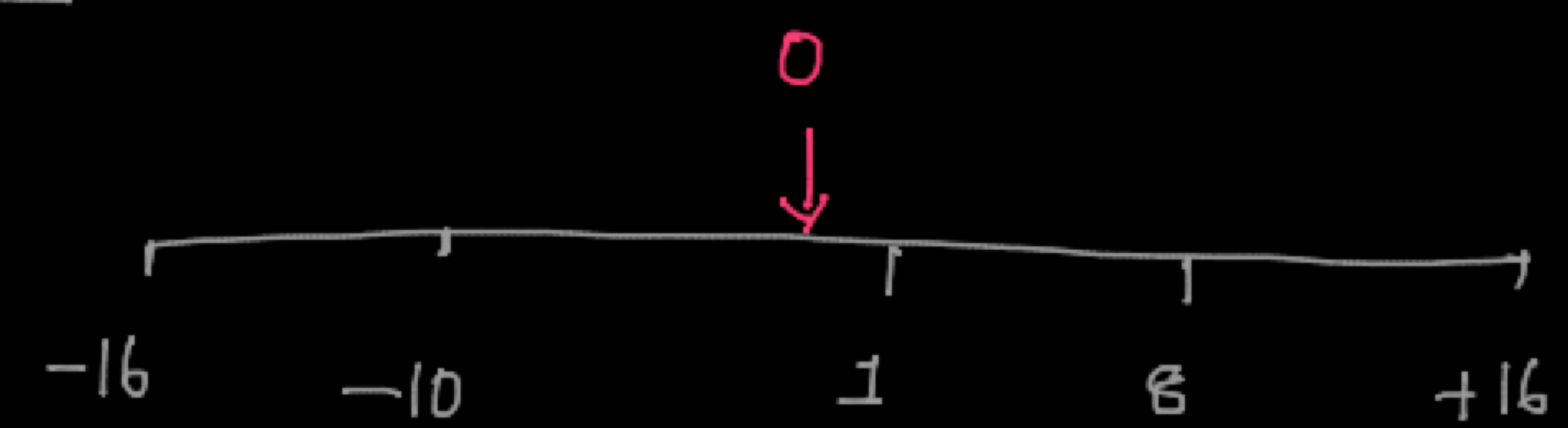
$\sigma \sqrt{135.5}$

$\sigma = 11.68$

57



Marks (X)	Z Marks	Z Normal
47	−0.85	0.187
65	0.68	0.75
→ 73	1.36	1 ←
→ 41	−1.36	0 ←
58	0.085	0.56



Z Marks (Standardized Marks)

− 0.85

+ 0.68

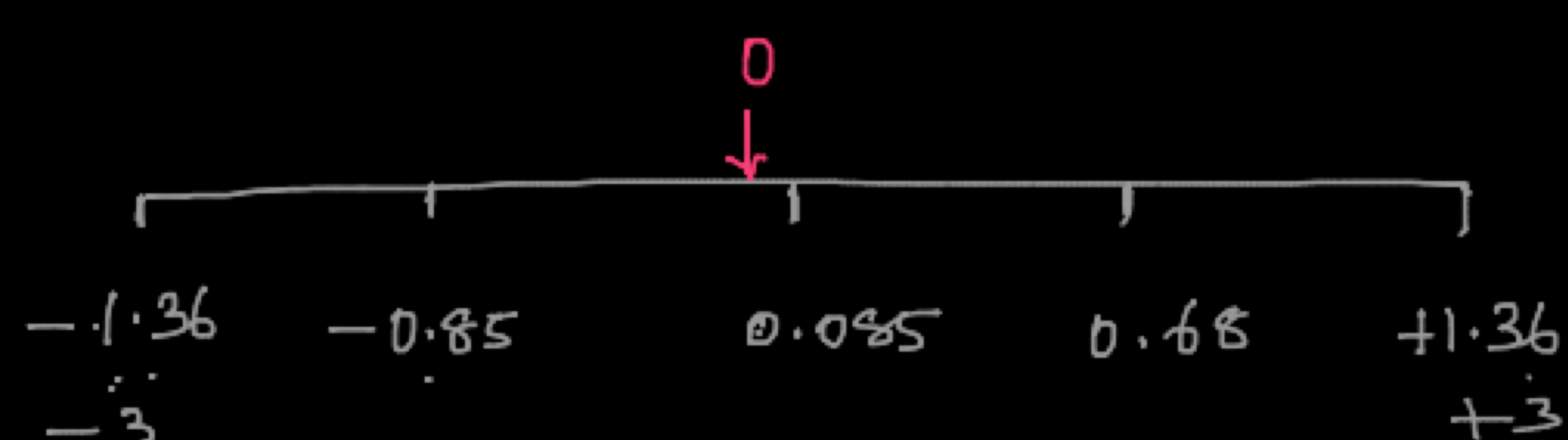
1.36

− 1.36

0.085

→ Mean = 0 ✓

$\sigma = 1$ ✓

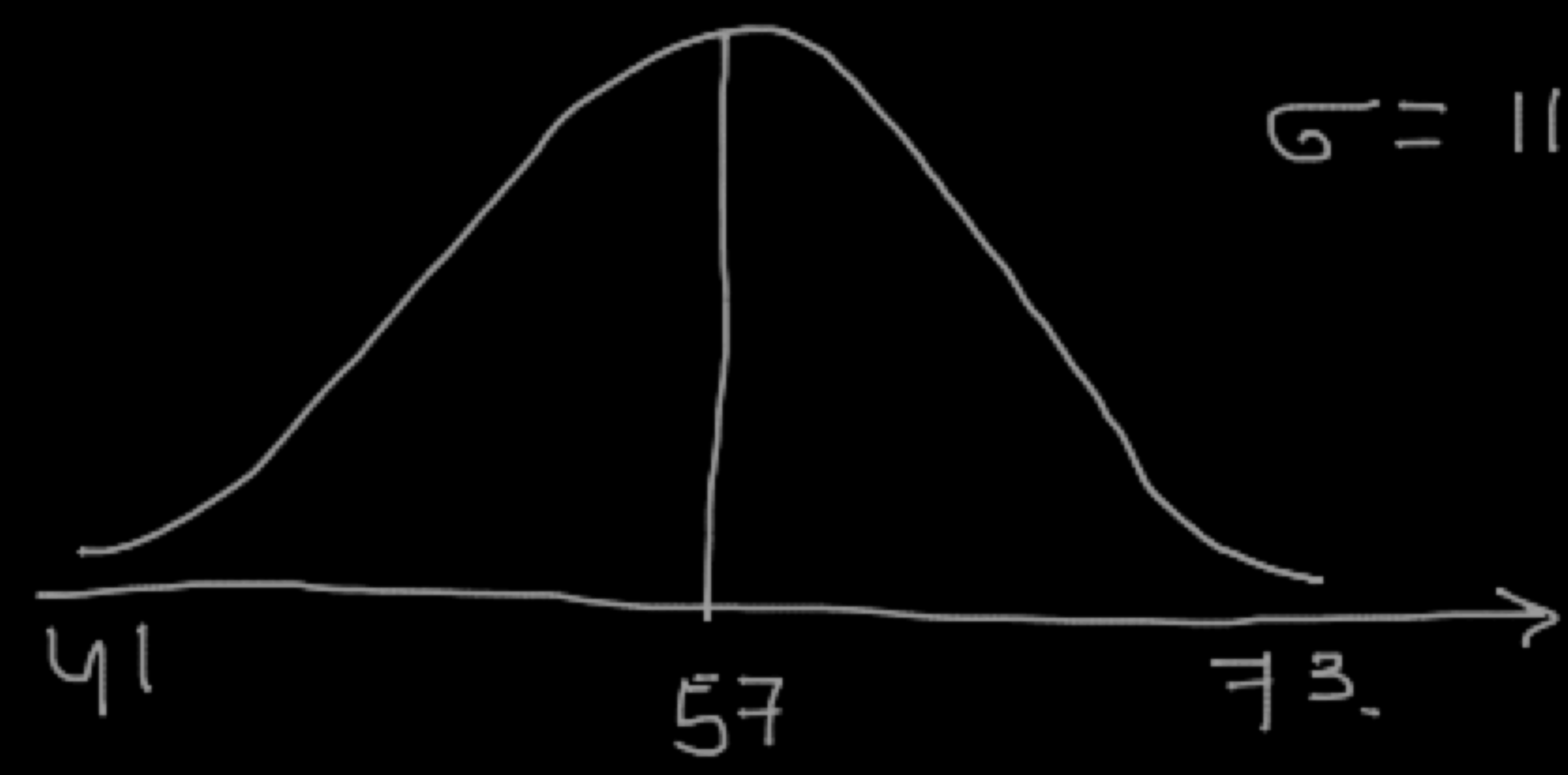


→ Standardized Marks

ND. $\quad \underline{X} \Rightarrow \underline{Z_x}$. $\quad$ SND.

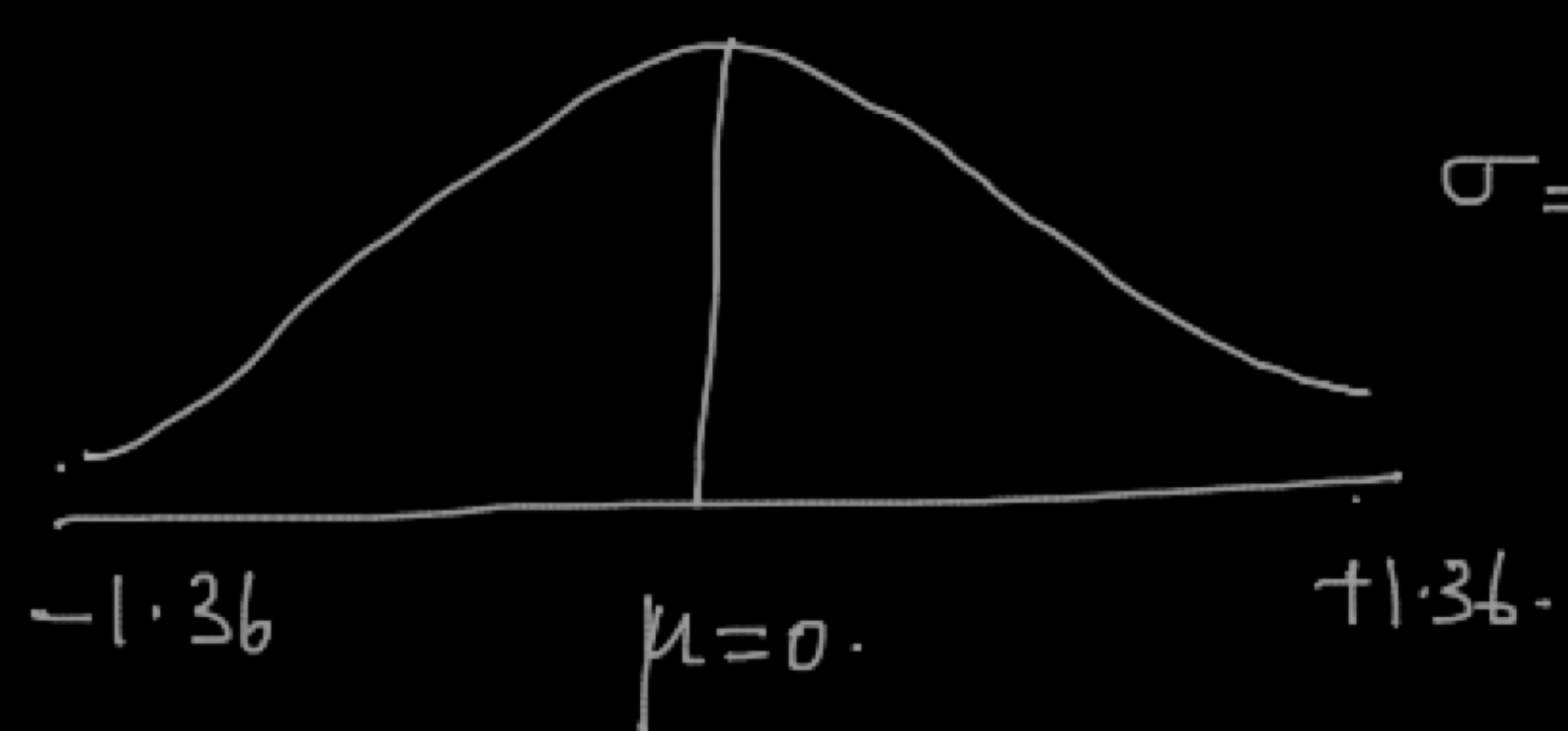
X	Z_x
x_1	$(x_1-\mu)/\sigma$
x_2	$(x_2-\mu)/\sigma$
x_3	$(x_3-\mu)/\sigma$
x_4	$\vdots$
$\vdots$	
x_n	$(x_n-\mu)/\sigma$
$\mu =$	$\underline{0} = \mu$
$\sigma =$	$\sigma = 1$

$\Rightarrow$ Standardize Marks



$\sigma = 11.68$

$\Downarrow$



$\sigma = 1$.

→ standardize Normal distribution

zoom.us Meeting View Edit Window Help

1. Scale the data -

Standr.
Zincome.

-0.41
1.34
0.41
-1.31

0

N Income	Income (x)	$(x - \bar{x})$	$(x-\bar{x})^2$	$\frac{x-\bar{x}}{\sigma}$
0.33	500 K	- 125 K	15625	-0.41
1	1000 K	375 K	140625	+1.34
0.66	750 K	+ 125	15625	0.41
0	250 K	- 375	140625	-1.34

μ 625 K

$\frac{2500}{4} = 625$

$\sigma^2 = 78125$

$\sigma \sqrt{78125} = 279.5$

$\sigma = 200\,k$

Zin

$$\frac{X - X_{min}}{X_{max} - X_{min}}$$

Min = 250 K.
Max = 1000 K

750 K.

$\frac{500\,k - 250\,k}{750\,k} = \frac{250}{750}$

Variance.

3 / 11

	Age	Income
P_1	23	5L
P_2	28	45L
	–	
	–	
	–	
	75	1Cr

$\mu =$ ___ ___ μ

$\sigma =$ ✓ ✓ σ

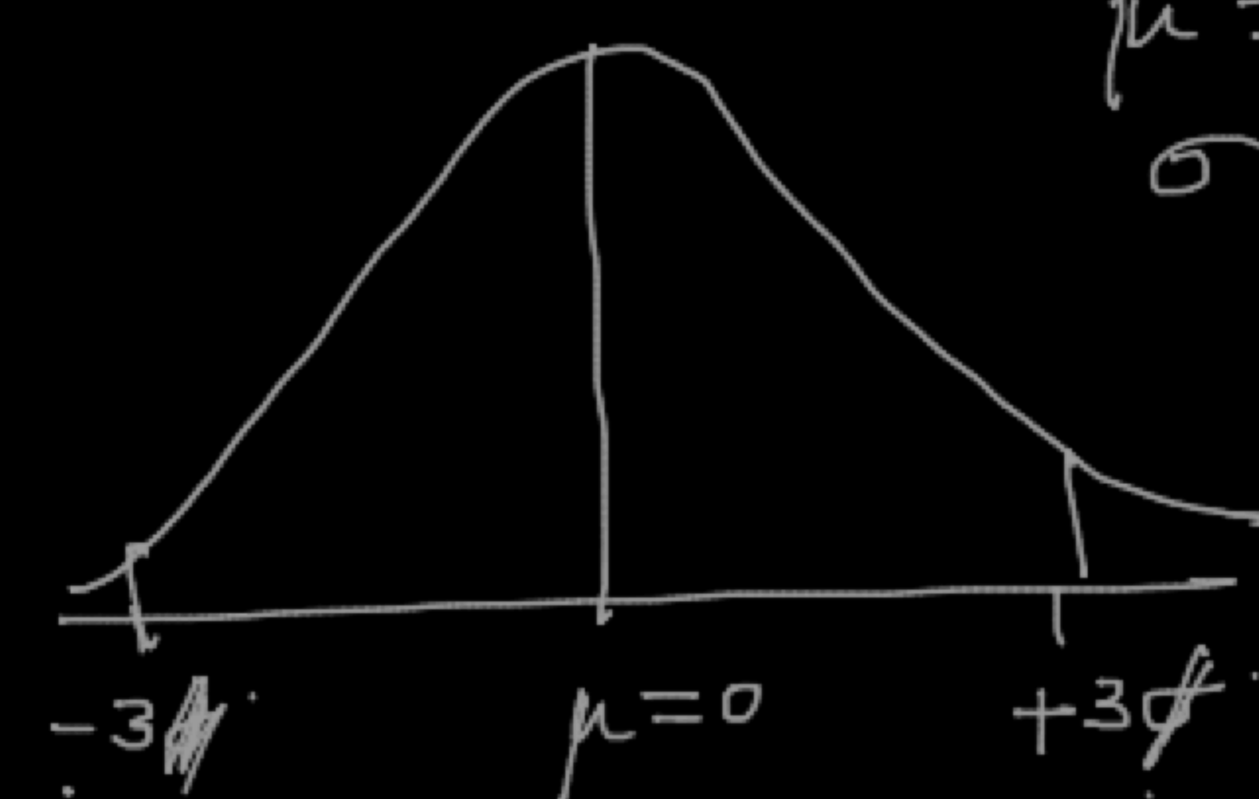
	Z_{Age}	Z_{income}
99.7	−3	−3 ✓
	+3	+3 ✓

$$(P_1 - P_2) = \sqrt{(23-25)^2 + (45L - 5L)^2}$$

$$= (2)^2 + (40{,}00{,}000)^2$$

SND

$\mu = 0$
$\sigma = 1$



← 99.7 →

$P_1 - P_2 =$

Scaling → Standar

Scaling of Data set -

1. Standardize.
2. Normalize -

Standardize

$$Z_X = \left[\frac{X - \mu}{\sigma}\right]$$

$\Rightarrow$ Probability.

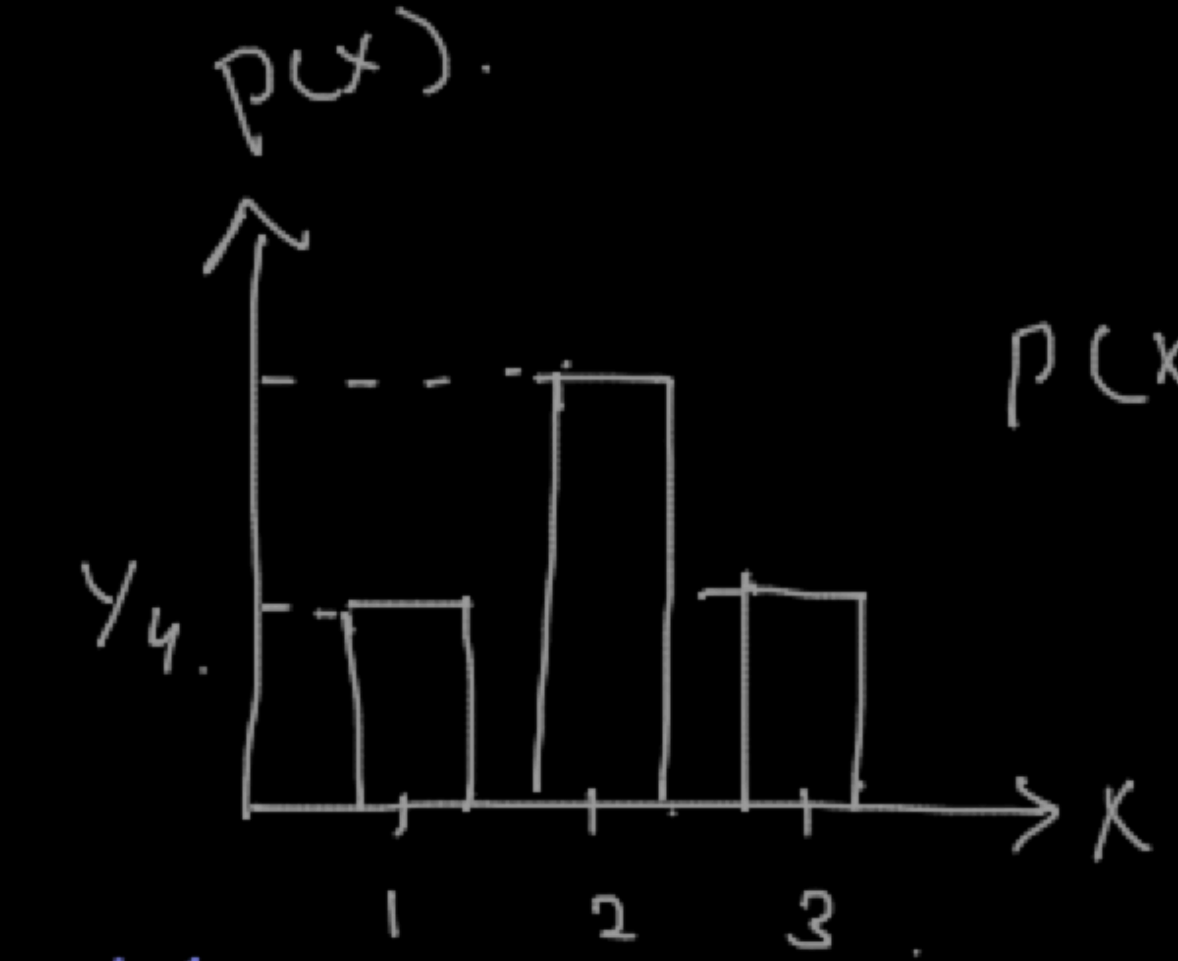
Normalize.

$$N_x = \frac{x - X_{min}}{X_{max} - X_{min}}$$

5 / 5

1. Normal Distribution -

2. Standardized Normal distribution



$P(X=1) = 1/4$.

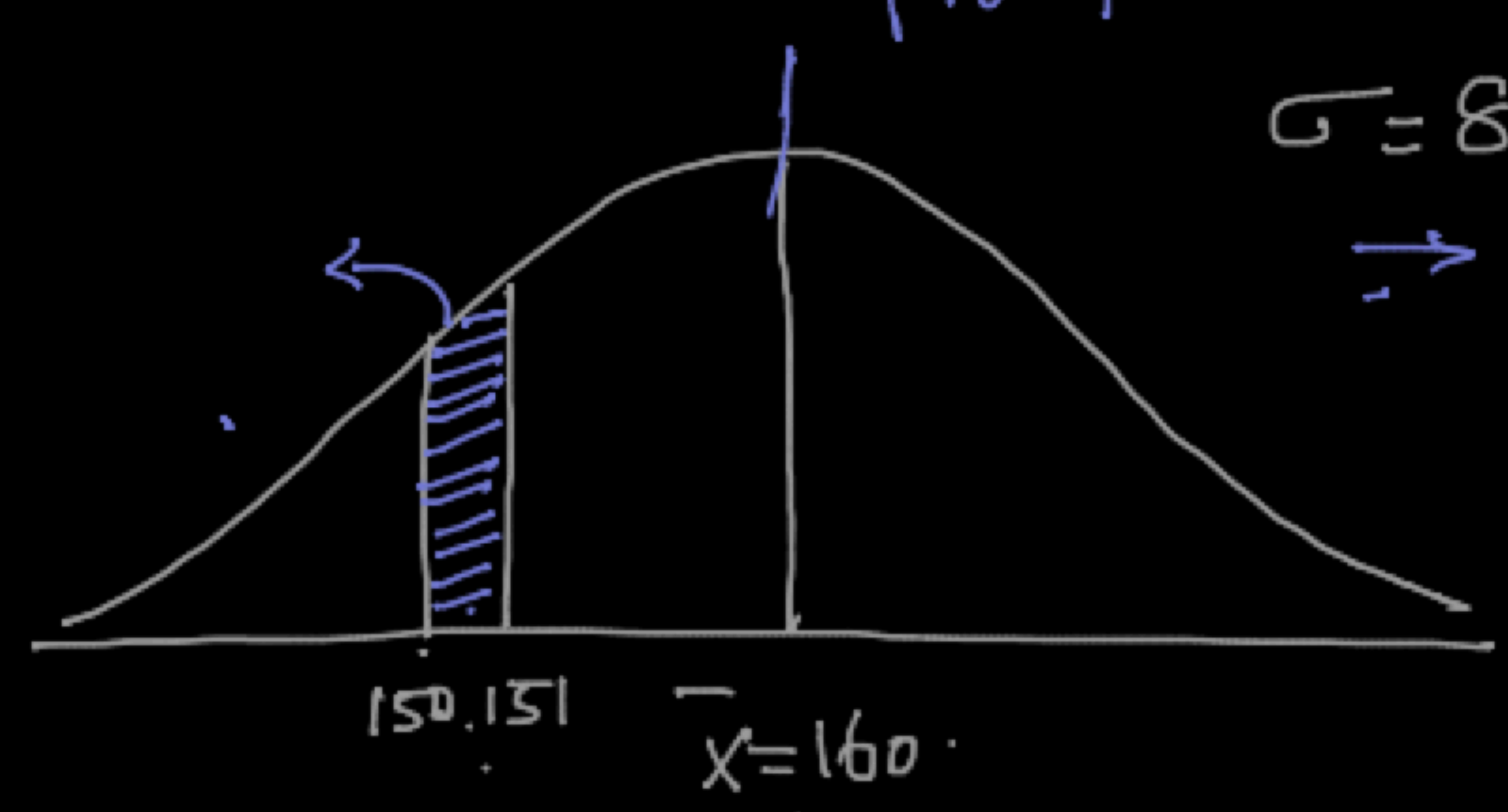
Probabilities

$$= \frac{150 - 160}{8}$$

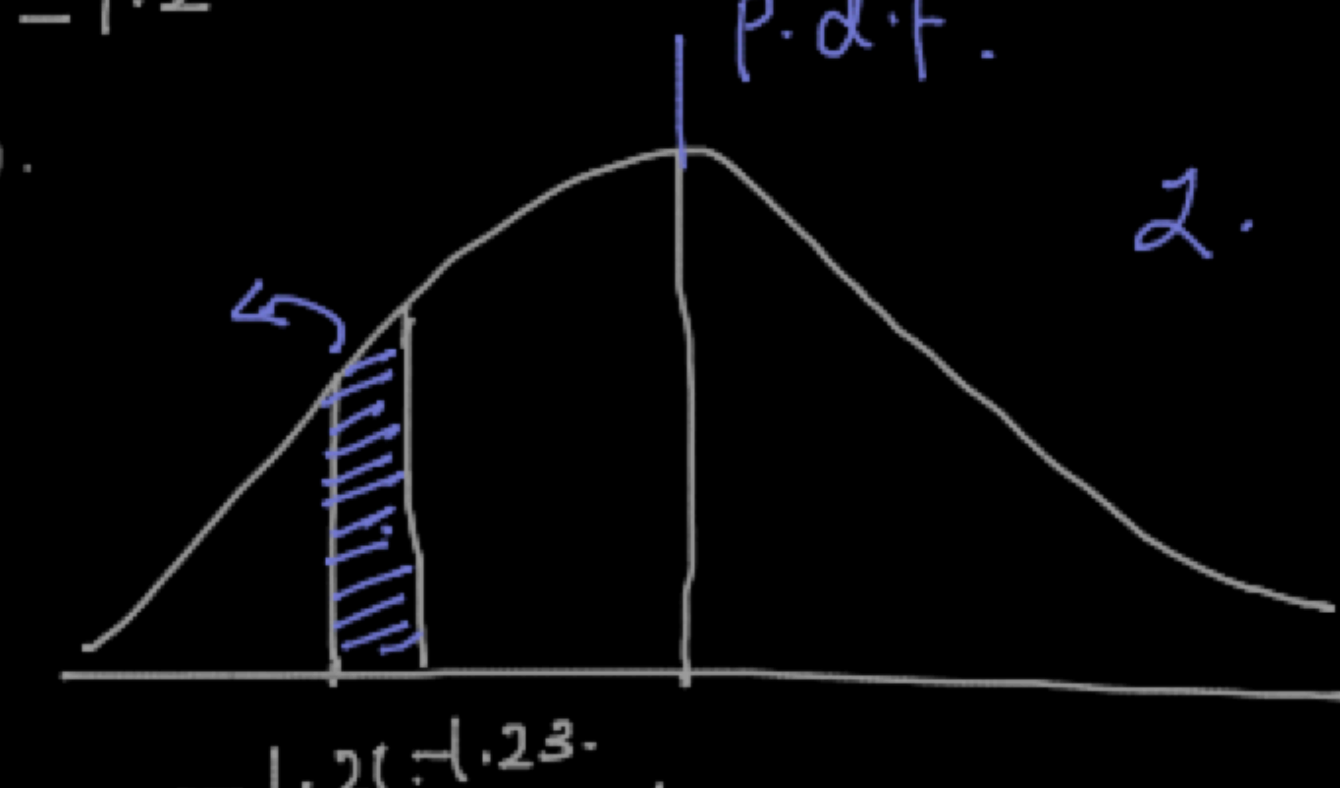
$$= -10/8 = -1.2$$

$$= \frac{151 - 160}{8}$$

$\sigma = 8$.



$\Rightarrow$



2.

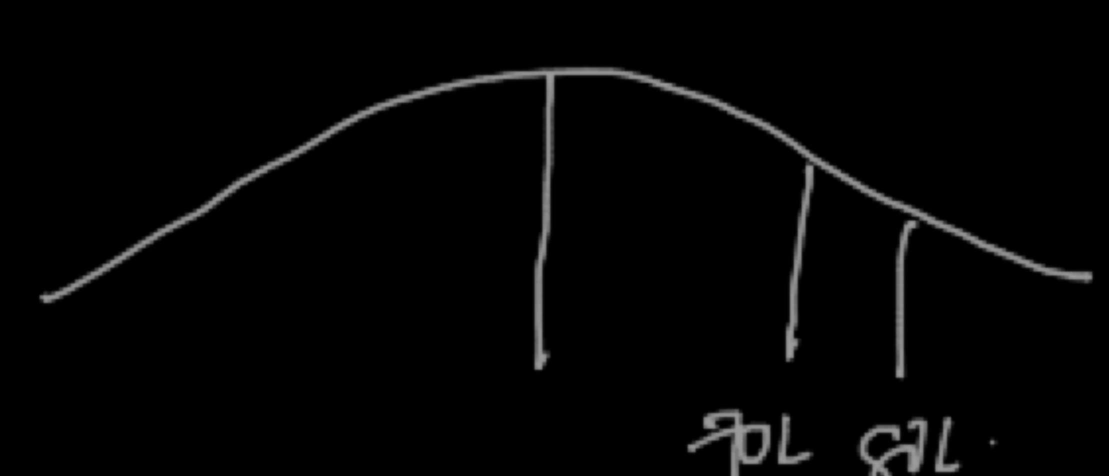
$$P(X) = \int_{150}^{151} p.d.f =$$

↳ standardize -

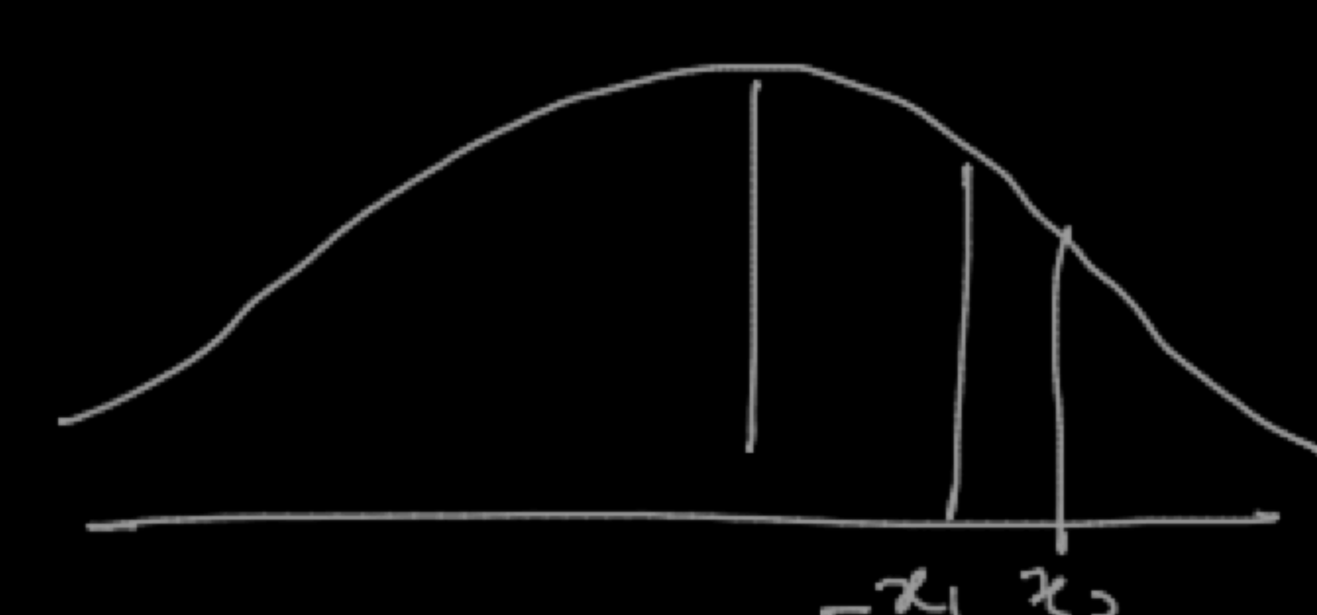
$$\int_{-1.21}^{-1.22}$$

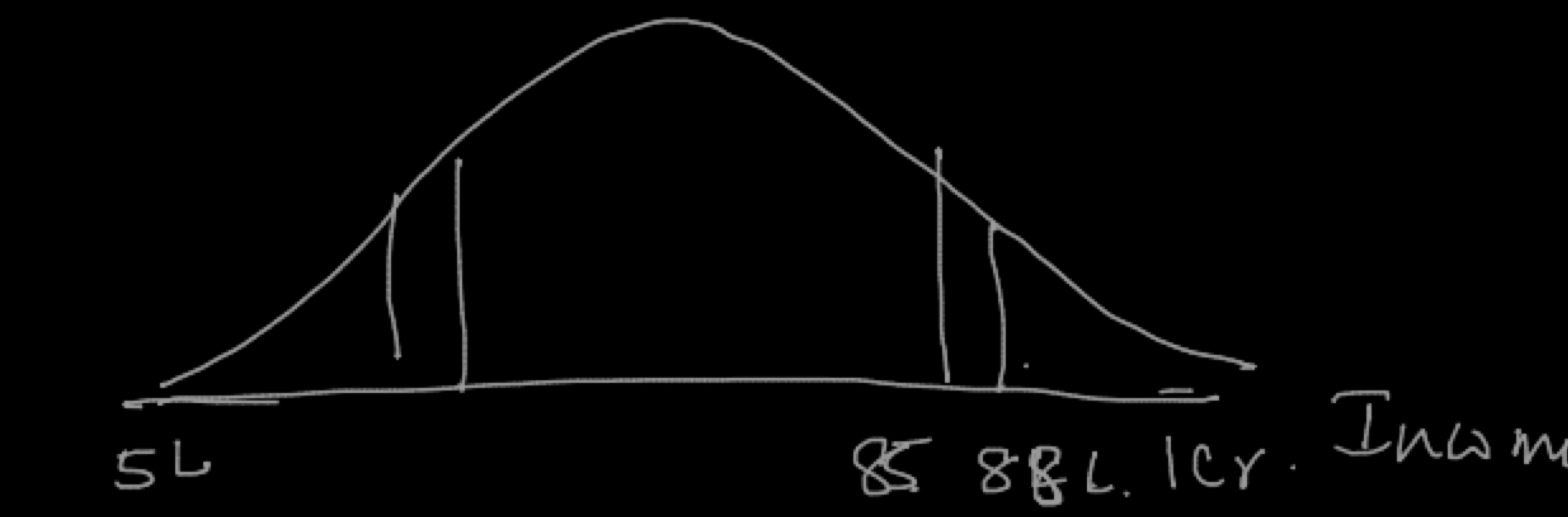
-3 & $+3$.

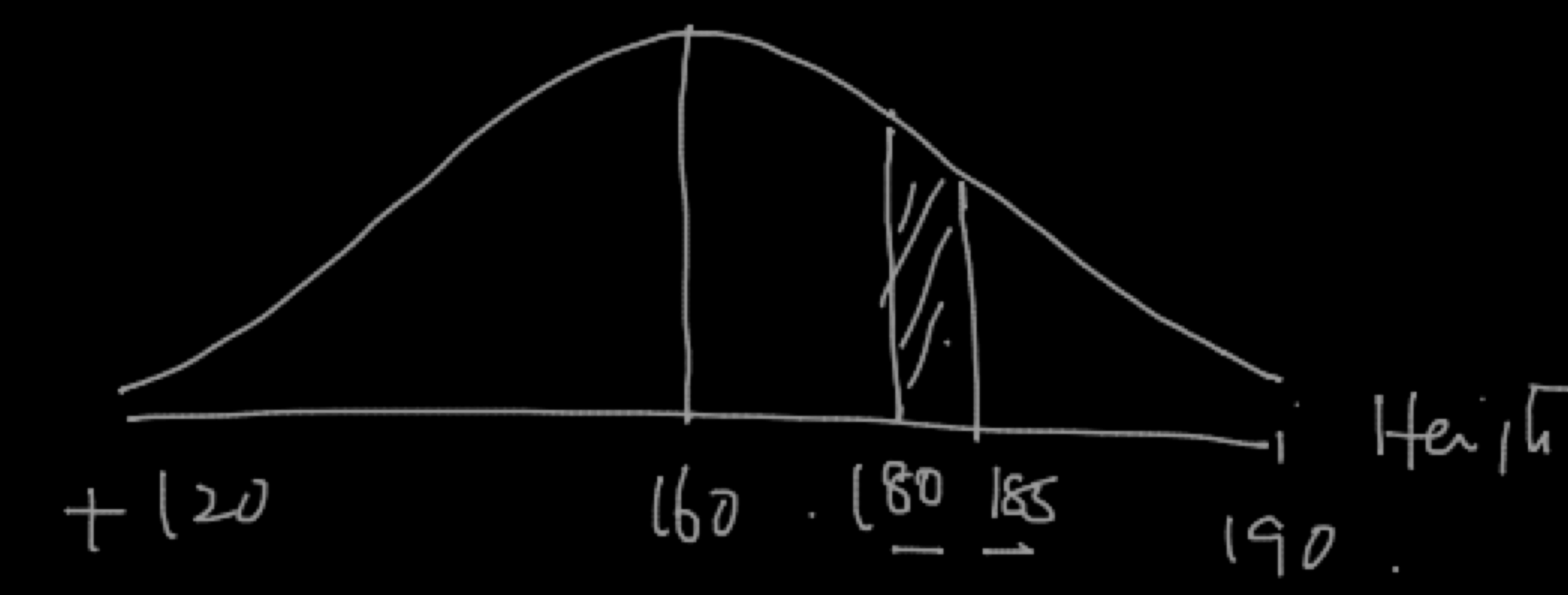
$\Rightarrow$

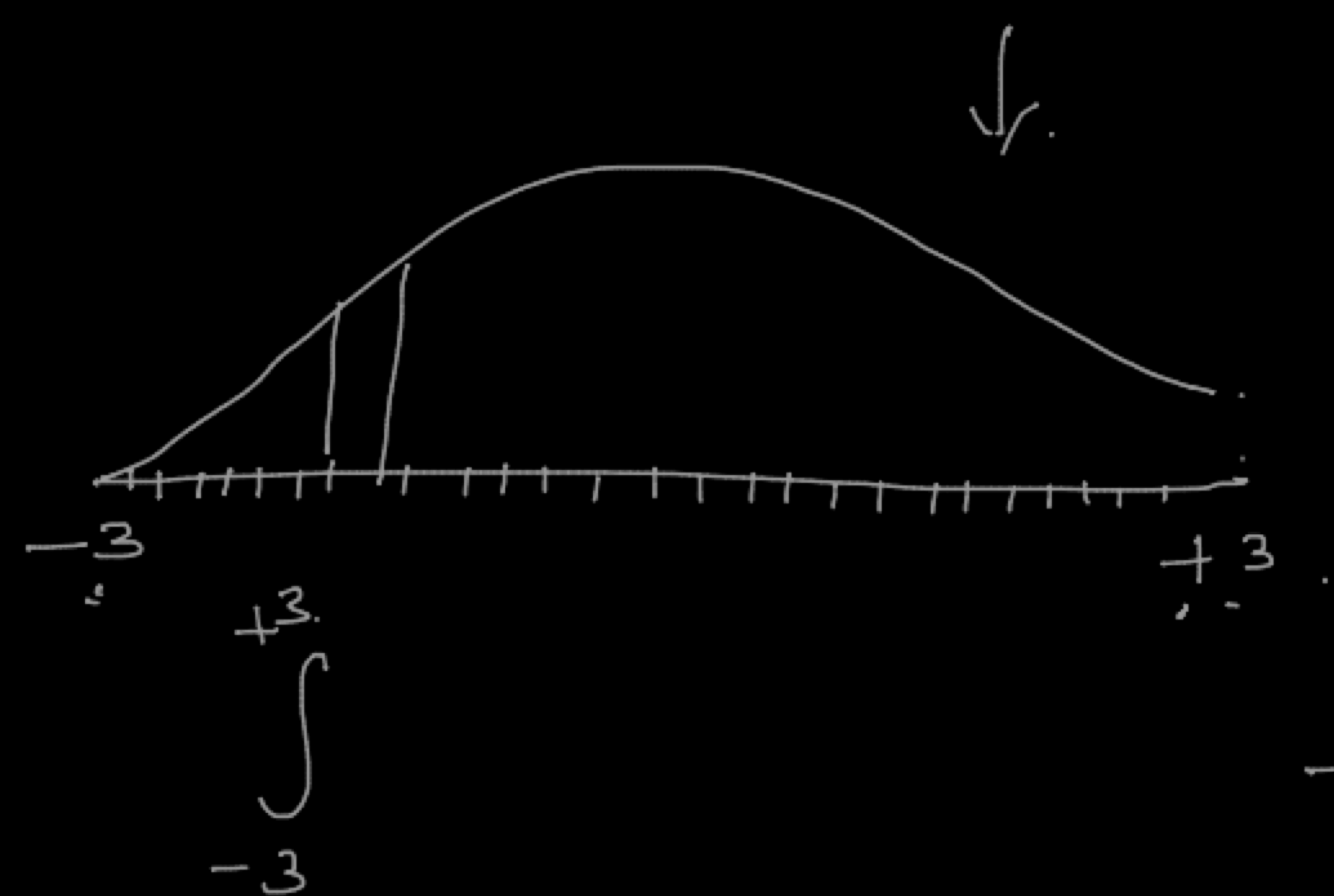


$\Rightarrow$









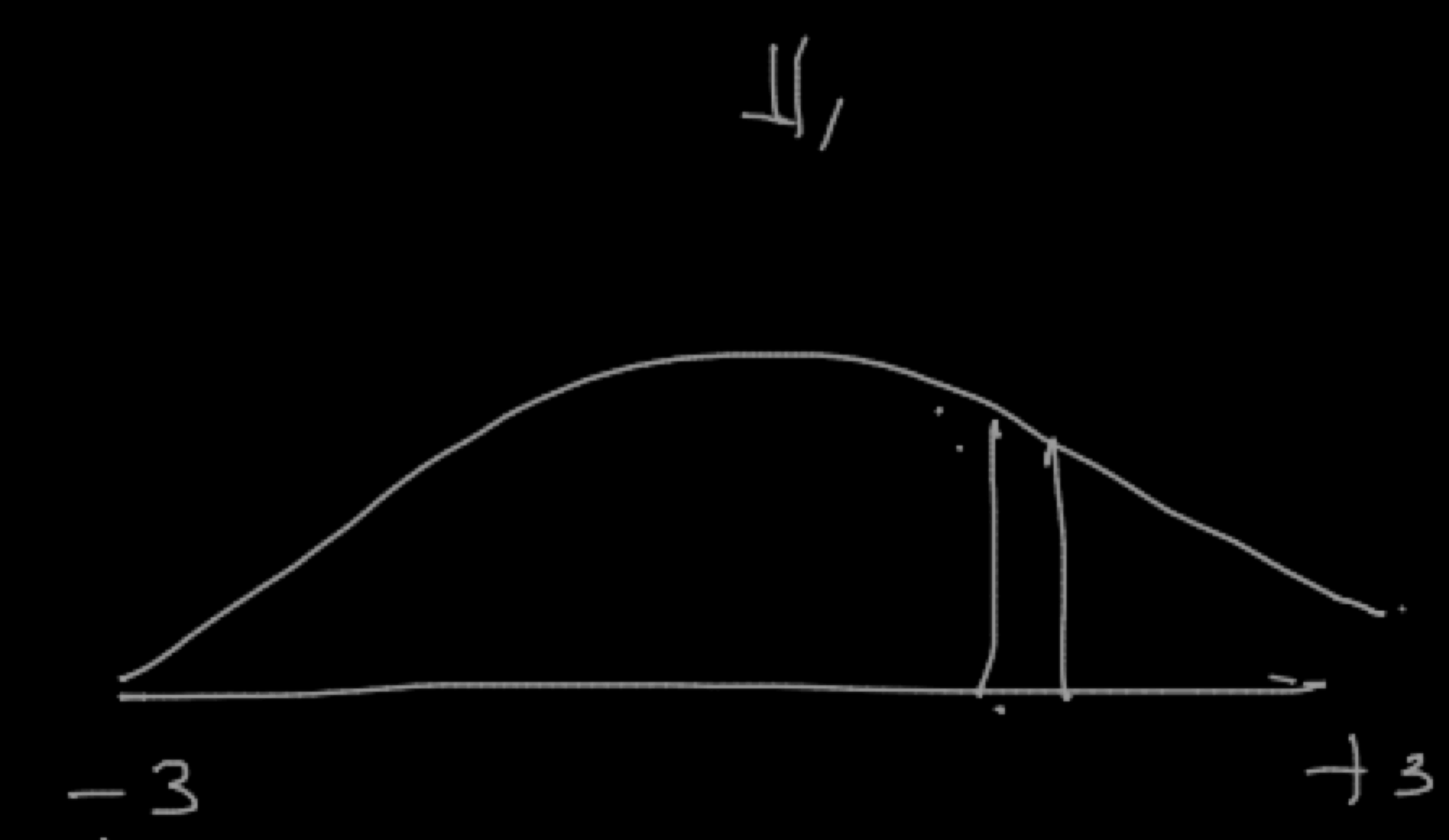
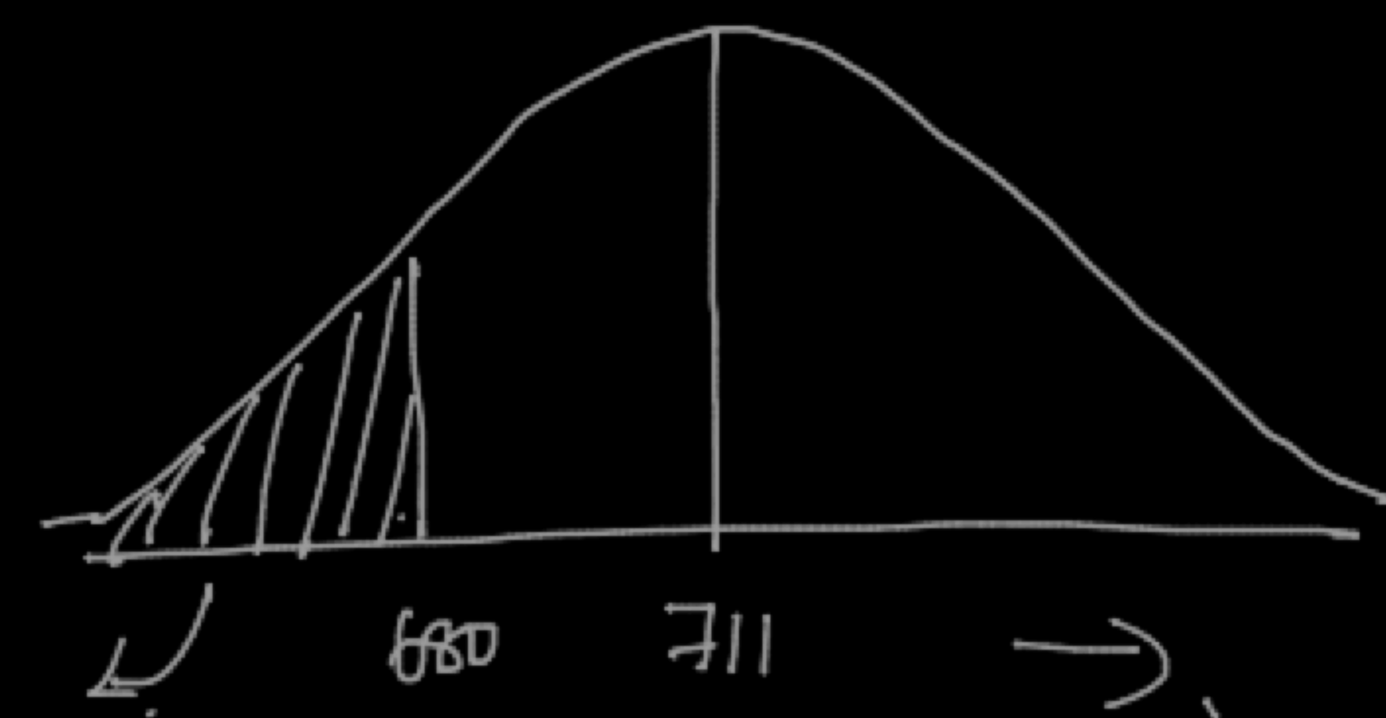


Table → log table

Preview File Edit View Go Tools Window Help

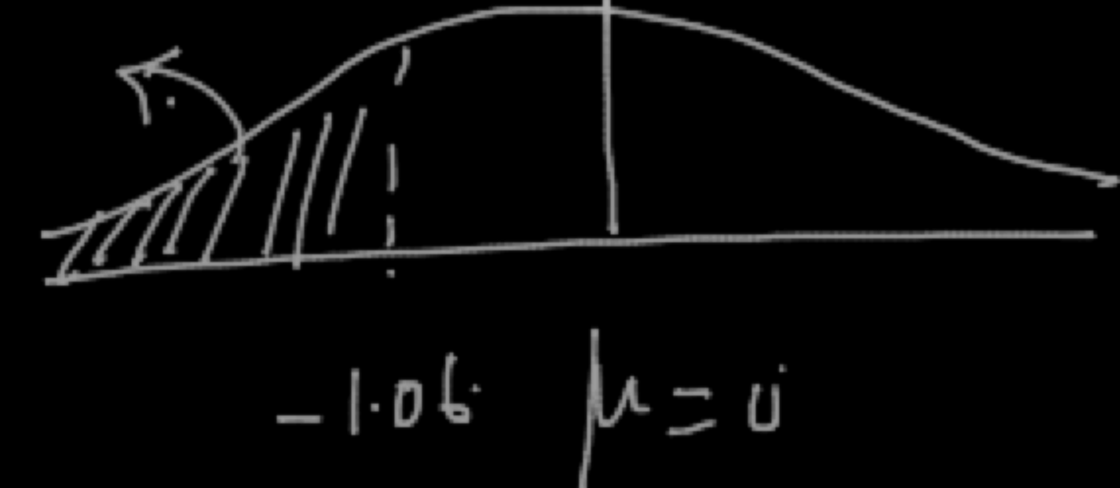


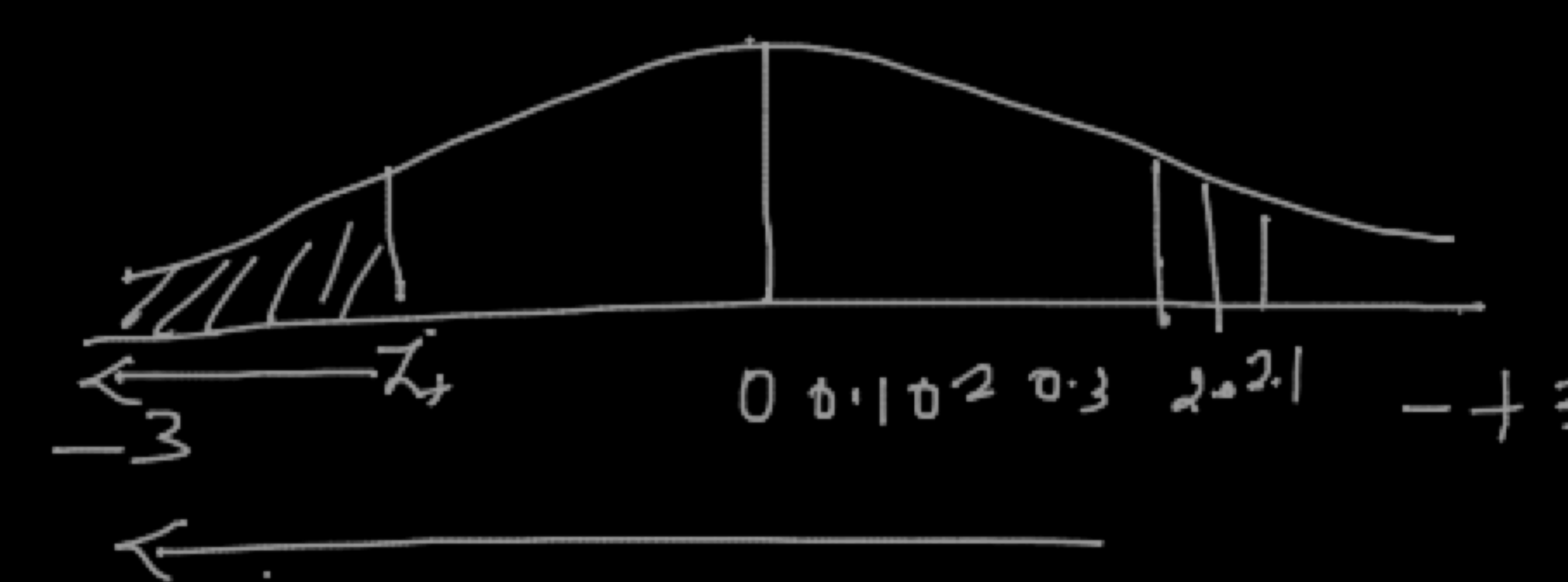
680.

$\int p.d.f.$

0

$p(x < ?)$





z table

8 / 8

$\sigma = 29$

$P(X \le 600)$

$\Rightarrow$

$$Z_x = \frac{X - \mu}{\sigma}$$

$$= \frac{600 - 711}{29} = -3.82$$

$P(X \le 600) \approx 0$

$P(X \le 720)$

$$Z_x = \frac{720 - 711}{29}$$

$$= 0.310$$

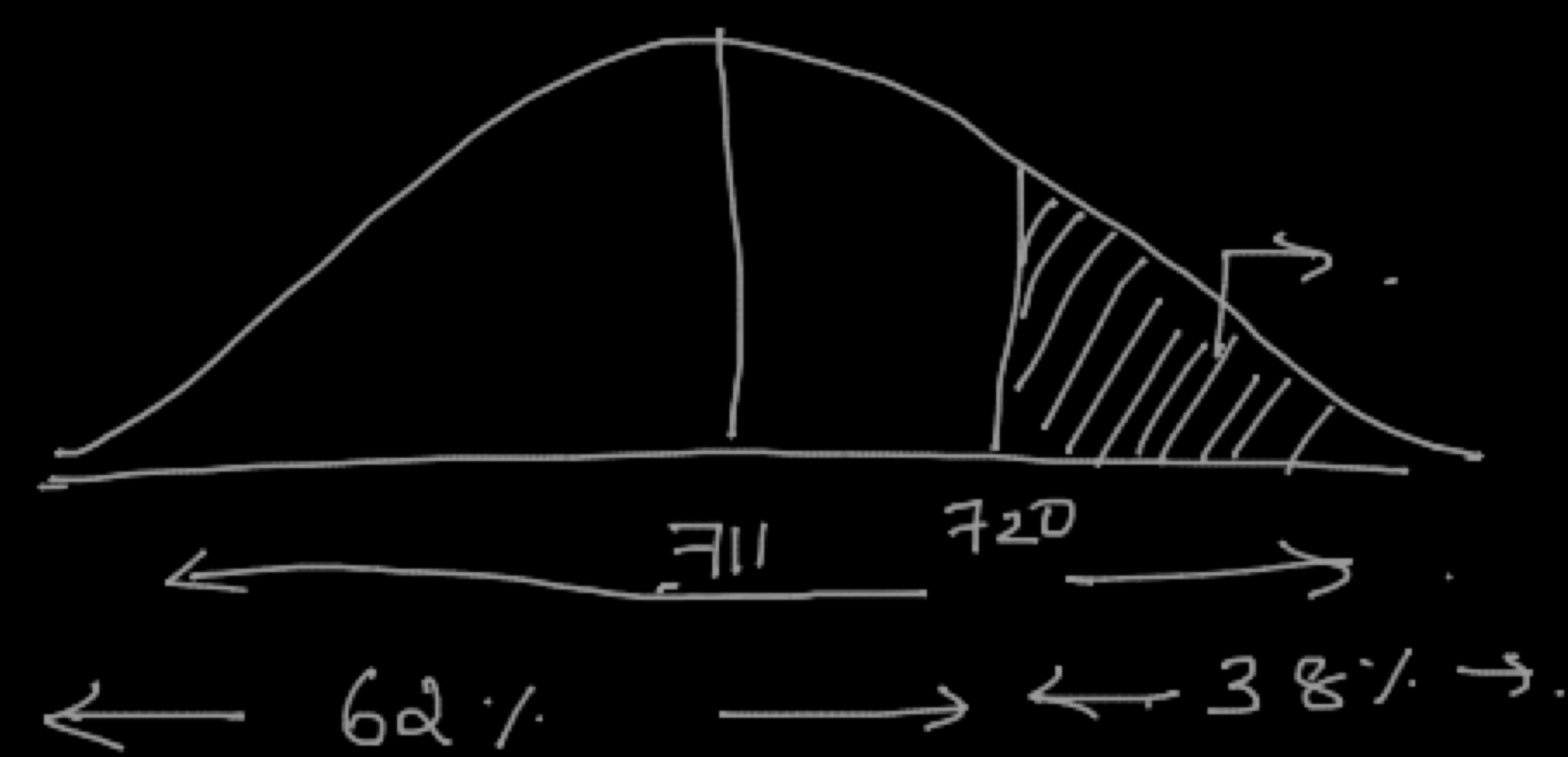
$P(X \le 720)$ 0.62172

$= 62\%$

$P(X > 720)$?

→ Normal.

$\boxed{10.30 \text{ am}}$



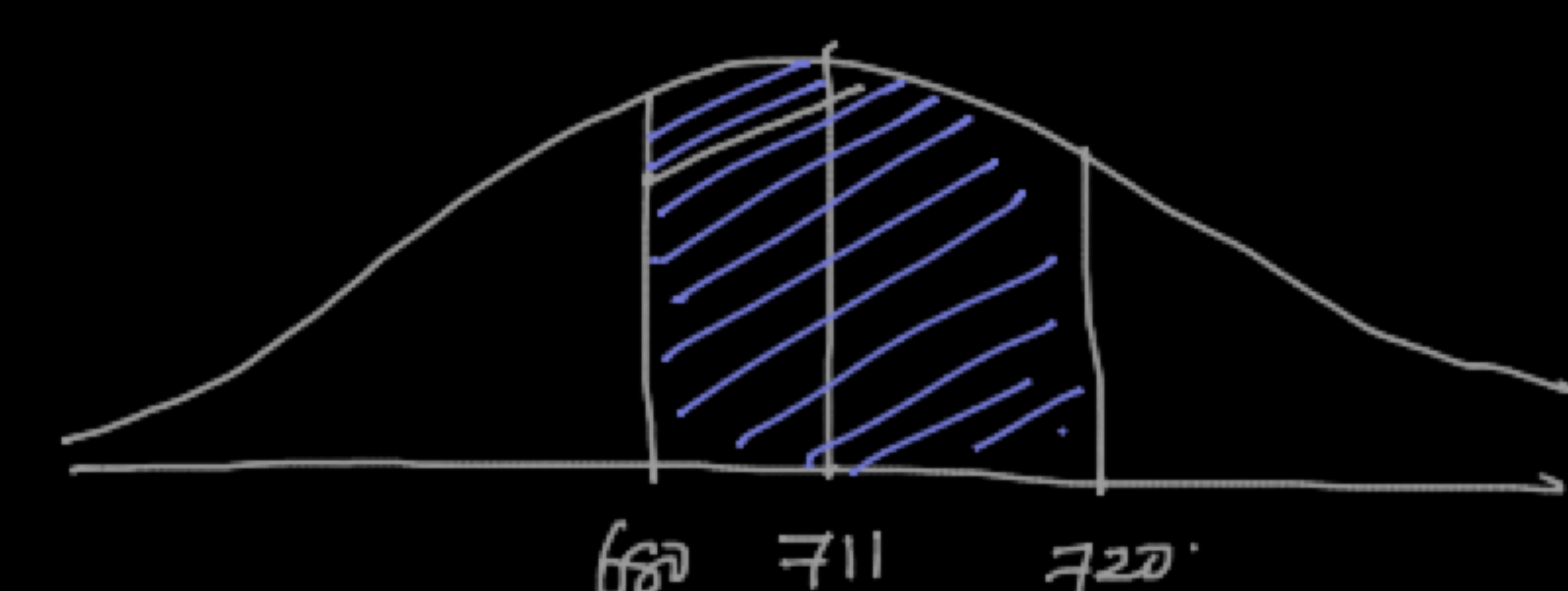
$1 - (\quad) =$

$1 - 0.62$

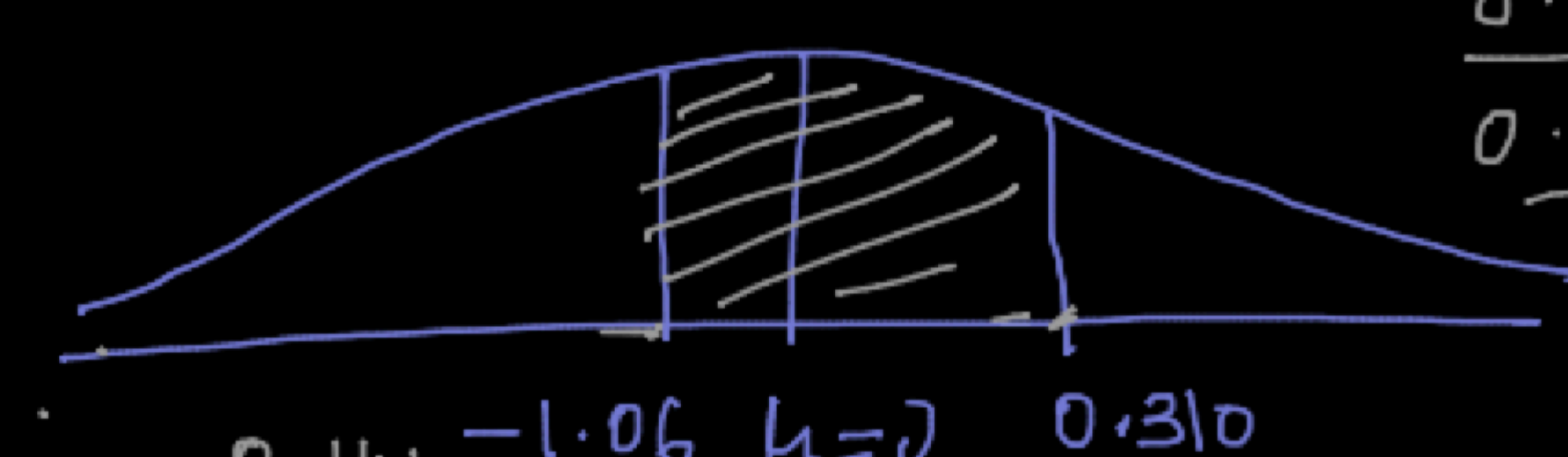
$P(x > 720) = 0.38$

$P(680 < x < 720)$

$\Rightarrow 48\%$.



$$\begin{array}{r} 0.62 - \\ 0.14 \\ \hline 0.48 \end{array}$$



Blackboard