

# Statistics

## Lecture 18



Feb 19-8:47 AM

Consider a uniform Prob. dist. for all values from 4 to 36.

1) Draw  $\bar{x}$ ; clearly label.  $\frac{1}{32}$

2) Find  $P(x=8)=0$

3) find  $P(x < 10 \text{ or } x > 30) = 1 - P(10 < x < 30)$

$$= 1 - (30-10) \cdot \frac{1}{32} = 1 - \frac{20}{32}$$

$$= \frac{12}{32} = \frac{3}{8}$$

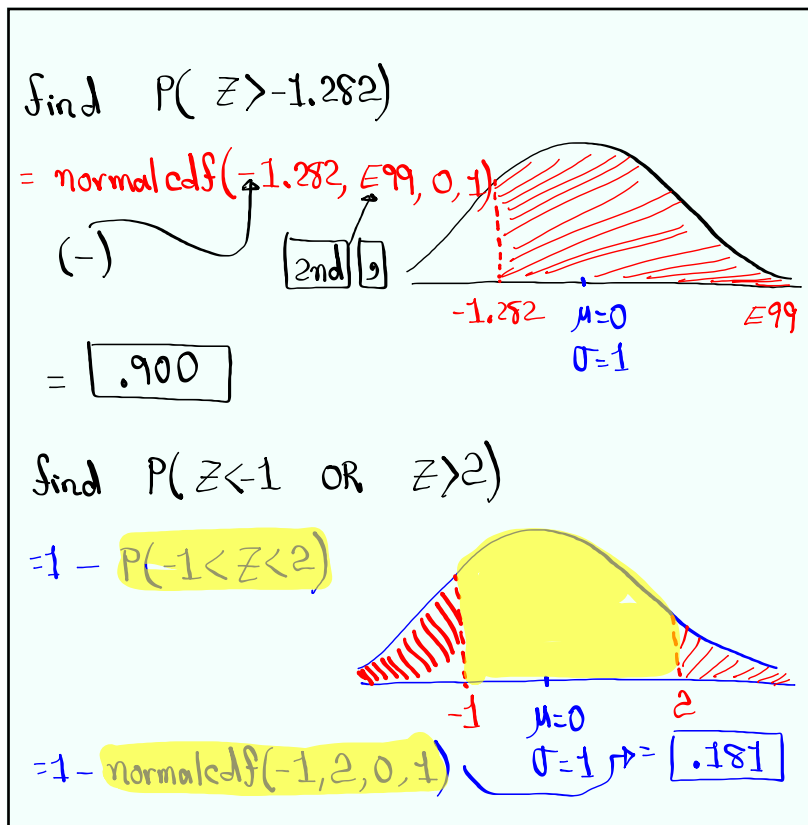
4) find  $x = Q_3$

75% below      25% above

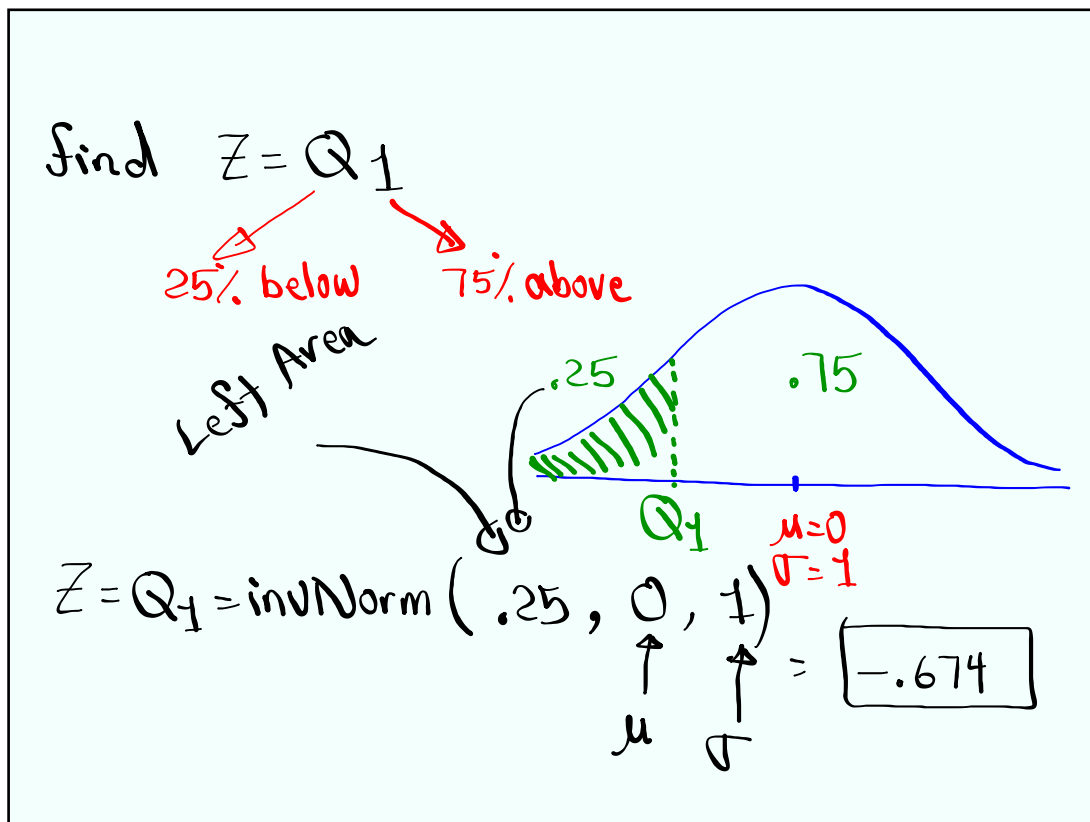
$(x-4) \cdot \frac{1}{32} = .75$

$x-4 = 32(.75) \rightarrow x = 4 + 32(.75)$        $x = 28$

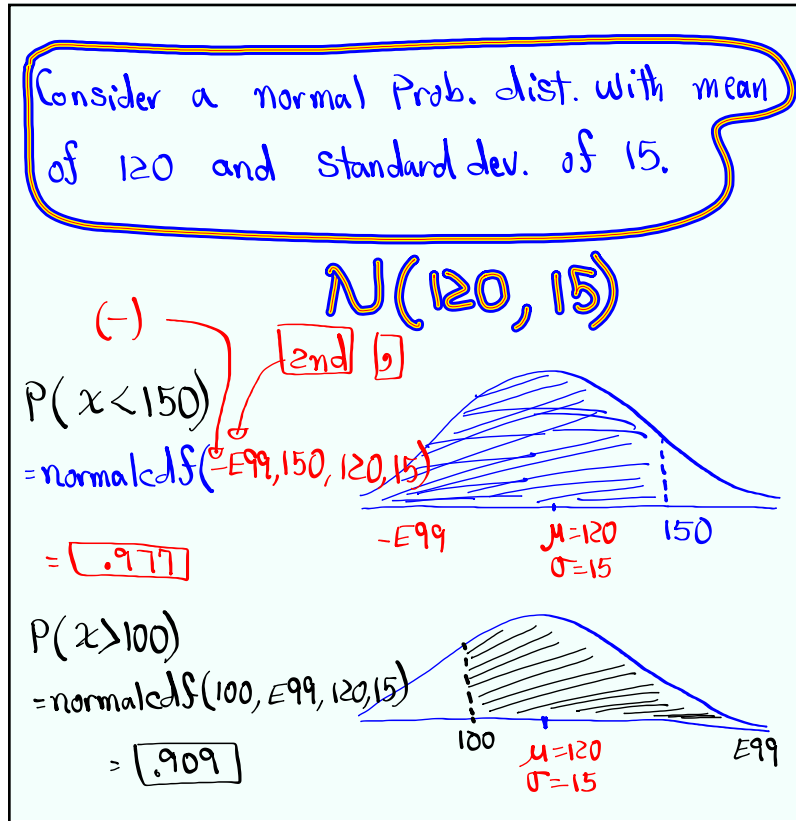
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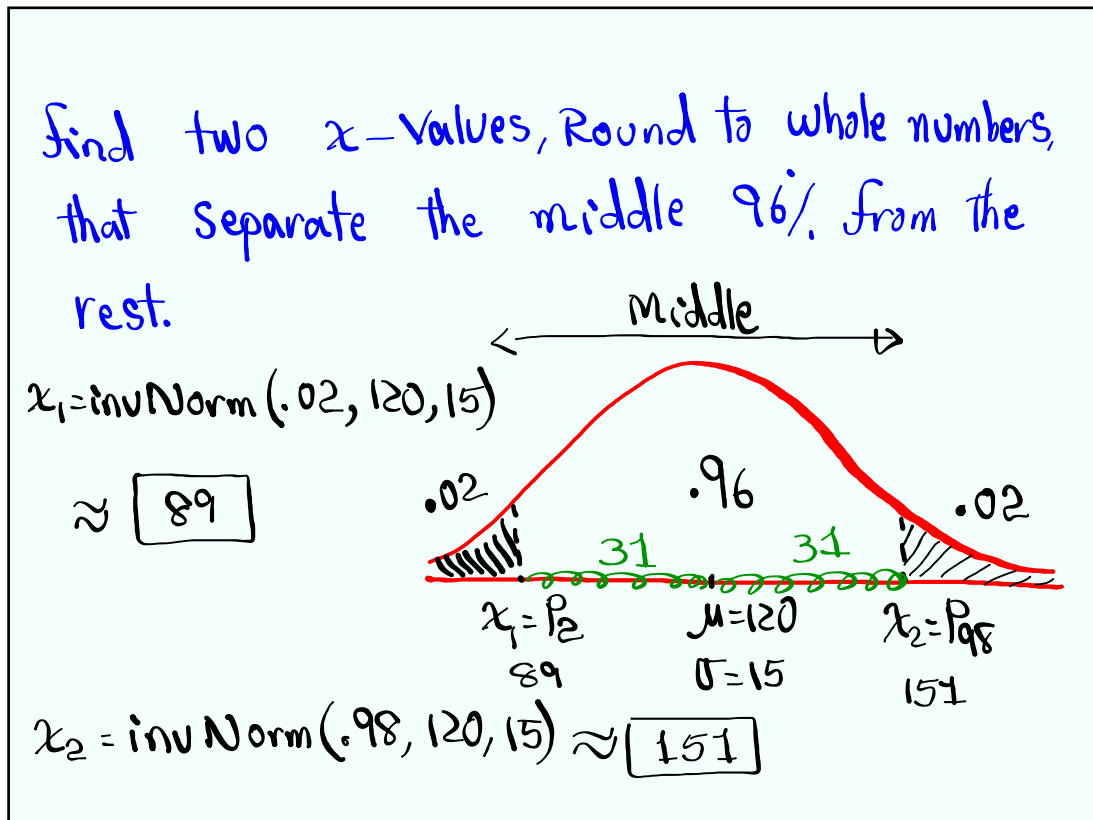
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Clear all lists  
 store 2, 4, 6, and 8 in L1  
 use 1-Var Stats with L1 only to find

$\mu = 5$        $\sigma = 2.236$        $\sigma^2 = 5$

Let's take all samples of size 2 with replacement from this data.

2,2	2,4	2,6	2,8
4,2	4,4	4,6	4,8
6,2	6,4	6,6	6,8
8,2	8,4	8,6	8,8

Now find  $\bar{x}$  for each sample

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

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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

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

Use 1-Var Stats with L2  $\hat{=}$  L3

Find  $\mu = 5$

$\sigma = 1.581$   
 $\sigma^2 = 2.5 = \frac{5}{2}$

**Central Limit Theorem**  
**C L T**

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