

① Suppose 100 babies are born in Hospital A and 50 babies are born in Hospital B. Assume  $P(\text{sex} = \text{Male}) = P(\text{sex} = \text{Female})$

What is the probability that 40% or less of the babies are Male in hospital A?  
' In hospital B?

(Hint: Use Normal Approximation)

② Suppose 10% of the population suffers from disease A. What is the probability that 3 or fewer would be in a class of

(a) 12 students (Hint: Table)

(b) 120 students (Hint: Normal approx)

③ Suppose we modeled a Health Score,  $H$ , as a normal random variable with  $\mu = 0$  and  $\sigma^2 = 4$ .

What is the probability that a randomly selected individual has a health score between  $-1$  and  $2$ ?

④ You roll a die 15 times.

What is the probability that you roll an ace  
13 or fewer times?

(Hint: Complement Rule  
Binomial Table)

⑤ Suppose Male birth weights <sup>for full term births</sup> are distributed normally with  $\mu = 3800$  grams and  $\sigma = 485$ .

Suppose Female birthweights for full term births are distributed normally with  $\mu = 3656$  grams and  $\sigma = 448$ .

What is the 75<sup>th</sup> percentile (quantile) for males and females?

⑥

Use the information from the previous problem.

Suppose  $p(\text{male}) = .4$

What is  $P(\text{randomly selected infant } \underset{\text{birthweight}}{< 3000\text{g}})$ ?

(Hint: Law of total probability).

⑦ Remember that for "large  $n$ "

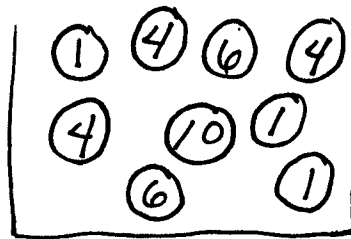
$\sqrt{n} \left( \frac{\bar{X} - \mu}{\sigma} \right)$  is approximately  $N(0, 1)$ .

For the following population,

what is the probability that

$$\bar{X} < 3$$

when  $n = 100$  are drawn with replacement?

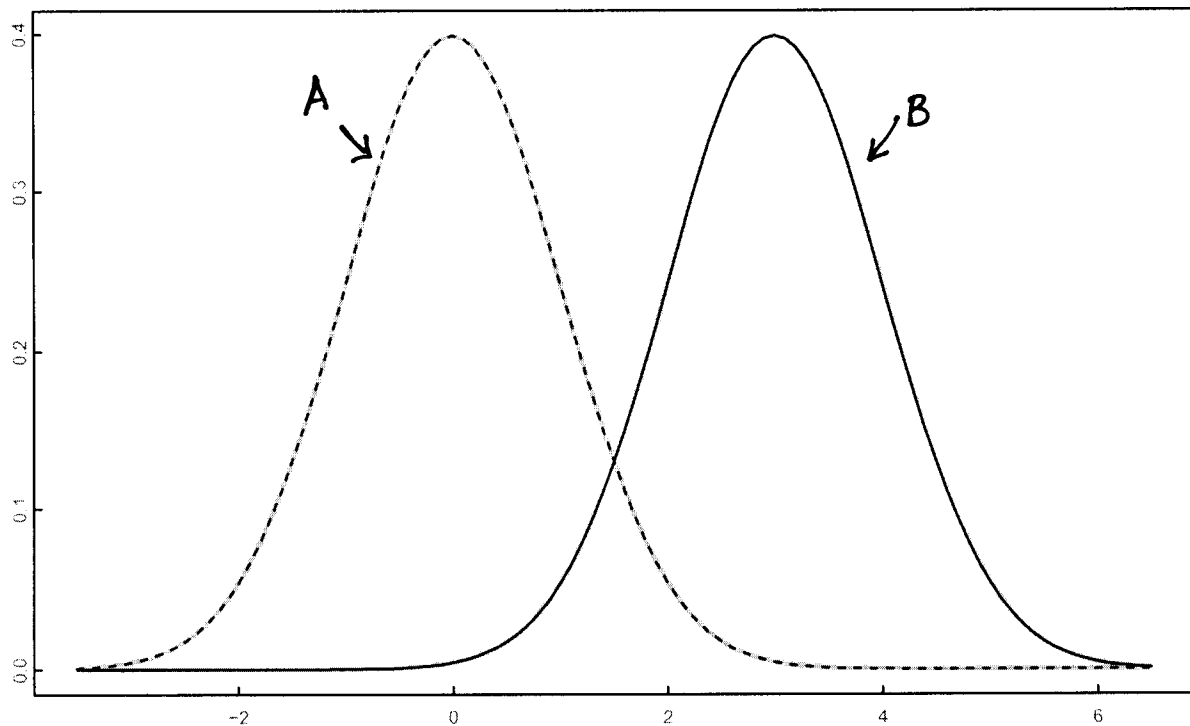


⑧  $A$  and  $B$  are the pdfs of two Normal R.V.s.

(a) What is the mean of  $A$ ?

(b) What is the mean of  $B$ ?

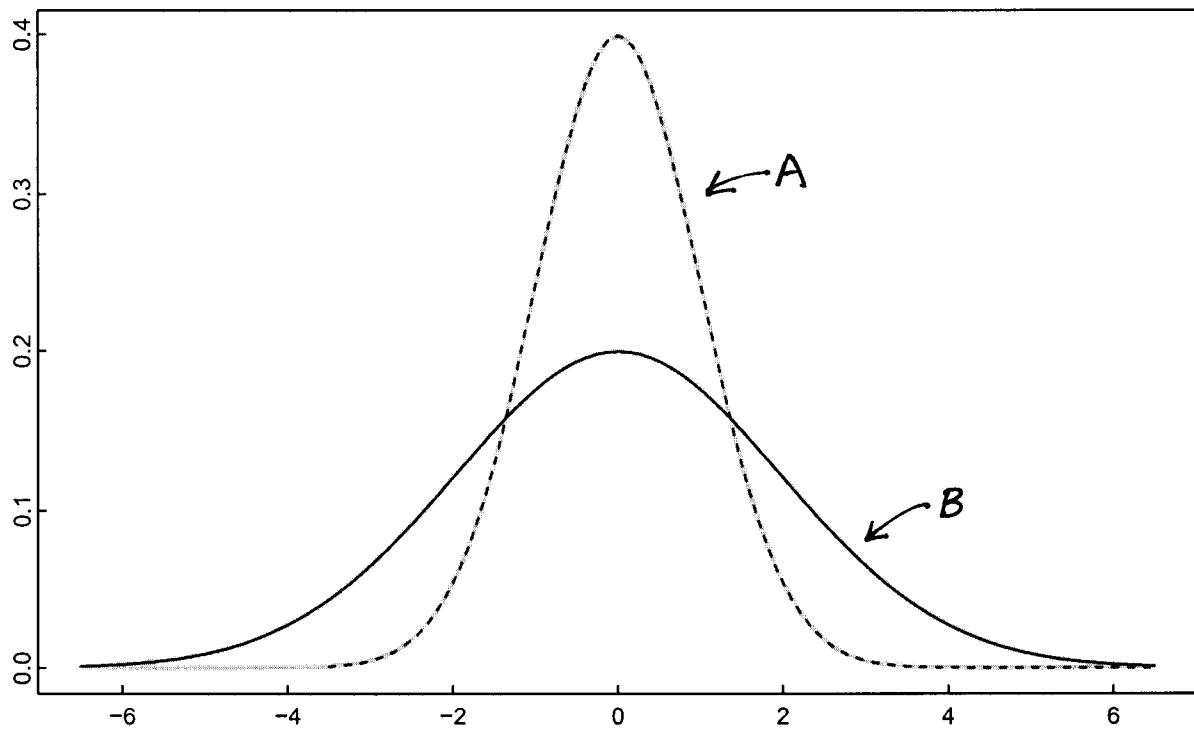
(c) Which has a larger population variance?





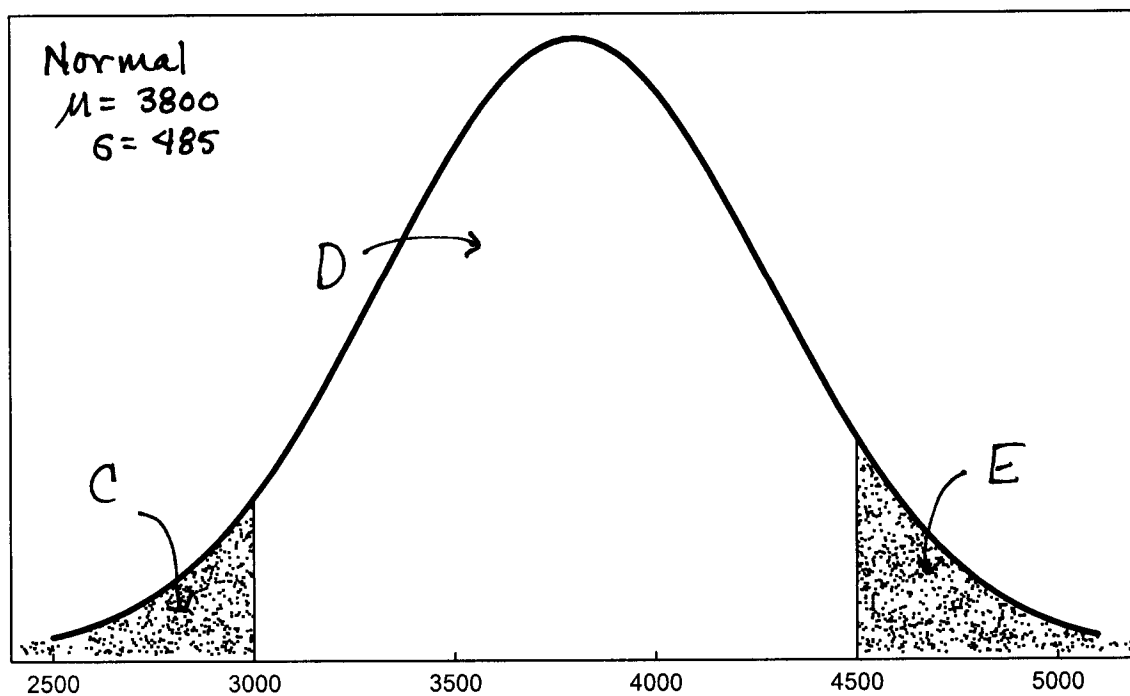
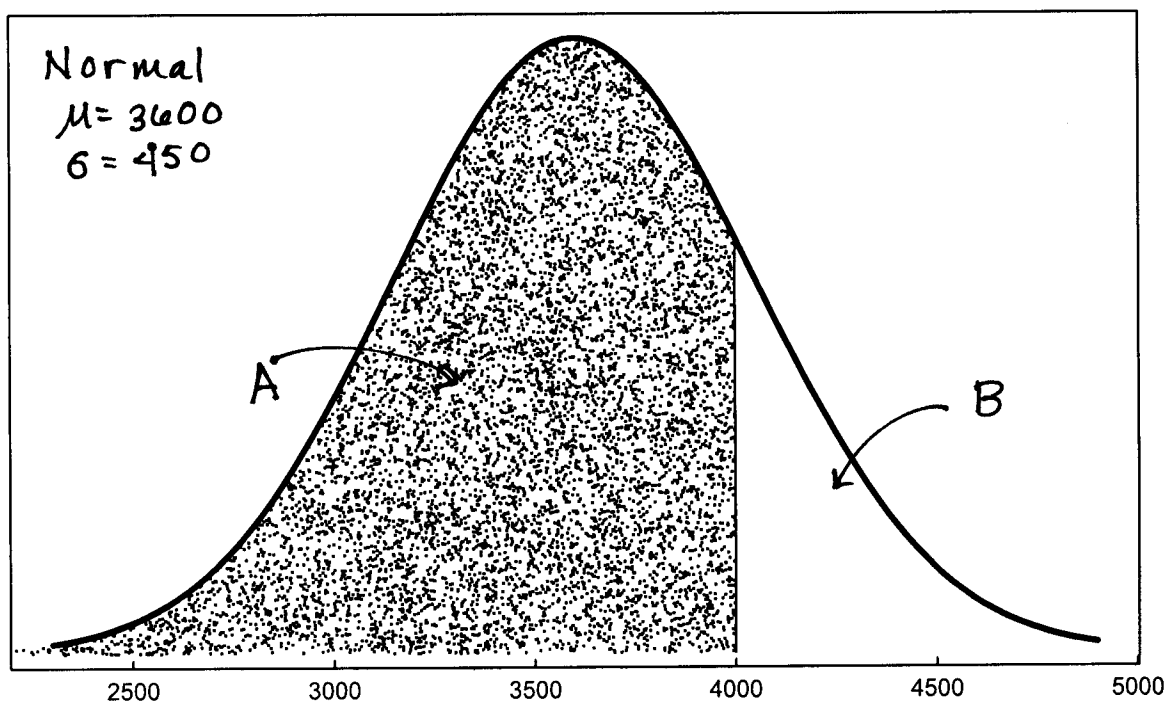
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Same questions as previous problem.



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Calculate the area of A, B, C, D, E.



⑪ If I make an average of 4 mistakes per lecture, what is the probability I make 3 or fewer mistakes in a lecture?

(Hint: Poisson Probability Table).