Your work must be very similar to my notes, lectures, or videos.

Be Neat, Organized, and No Work $\Leftrightarrow$ No Points

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1. **Consider the data** $2, 4, 6, 8, 10, 12,$ **and** $14.$ **Store them in** L_1**, and then**

   (a) **(2 points) find** μ**.**

   (a) _____

   (b) **(2 points) find** σ**.**

   (b) _____

   (c) **(3 points) find** σ^2**.**

   (c) _____

   (d) **(2 points) Take samples of size** 2 **with replacement from this population, list all your samples in the table below:**

$2,2$	$2,4$	$2,6$	$2,8$	$2,10$	$2,12$	
$4,2$	$4,4$					
$6,2$						
$8,2$						
$10,2$						

(e) **(2 points)** Now find the mean of each sample, and place all the sample means in the table below:

2	3	4	5	6	7	
3	4					
4						

(f) **(3 points)** Complete the following probability distribution table for all the sample means: Write $P(\overline{x})$, in fractions(do not reduce).

$\overline{x}$	$P(\overline{x})$	$\overline{x}$	$P(\overline{x})$	$\overline{x}$	$P(\overline{x})$
1	$\frac{0}{49}$				
2	$\frac{1}{49}$				
3	$\frac{2}{49}$				
4					
				15	$\frac{0}{49}$

(g) **(6 points) Draw the probability distribution histogram using $\bar{x}$ and $p(\bar{x})$ superimposed with a bell curve. Clearly label and mark your graph.**
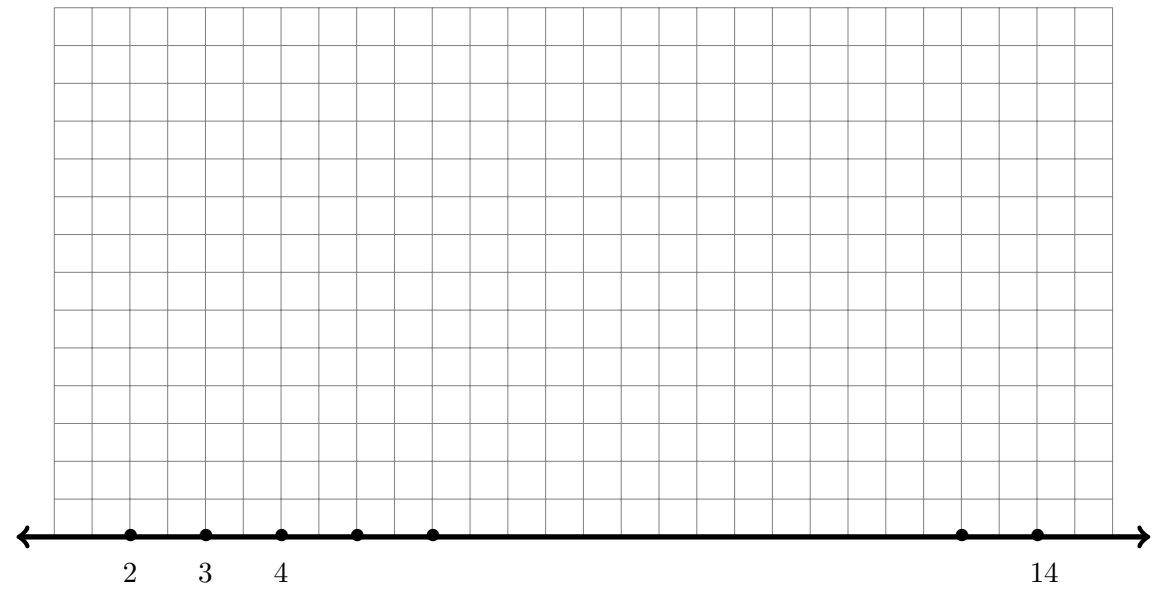
Now enter all the sample means $\bar{x}$ in L_2, and corresponding probabilities $P(\bar{x})$ in L_3.

(h) **(2 points) find $\mu_{\bar{x}}$.**

(h) _____

(i) **(2 points) find $\sigma_{\bar{x}}$.**

(i) _____

(j) **(3 points) find $\sigma_{\bar{x}}^2$.**

(j) _____

2. **With a sample size $n = 16$ of the normally distributed population with the mean of $\mu = 6500$ and standard deviation of $\sigma = 275$,**

(a) **(2 points) find $\mu_{\bar{x}}$.**

(a) _____

(b) **(3 points) find $\sigma_{\bar{x}}$.**

(b) _____

3. With a sample size $n = 25$ of the normally distributed population with the mean of $\mu = 125$ and standard deviation of $\sigma = 10$,

   (a) (**2 points**) find $\mu_{\bar{x}}$.

   (a) _____

   (b) (**3 points**) find $\sigma_{\bar{x}}$.

   (b) _____

4. The heights of a certain breed of dogs has a normal distribution with a mean of 28 inches and a standard deviation of 4 inches. If we randomly select 64 of these dogs, what is probability that the mean height of 64 dogs is

   (a) (**3 points**) less than 27 inches?

   (a) _____

   (b) (**3 points**) greater than 28.5 inches?

   (b) _____

5. The average life of a certain blender is 4.5 years with a standard deviation of 1.25 years. Assuming that the lives of these blenders follow approximately a normal distribution, find

   (a) (**3 points**) the probability that the mean life of a random sample of 8 such blenders fall between 4 and 6 years.

   (a) _____

   (b) (**4 points**) the value of $\bar{x}$ that separates the top 15% from the rest for a random sample of 8 such blenders. Round your answer to one decimal place.

   (b) _____