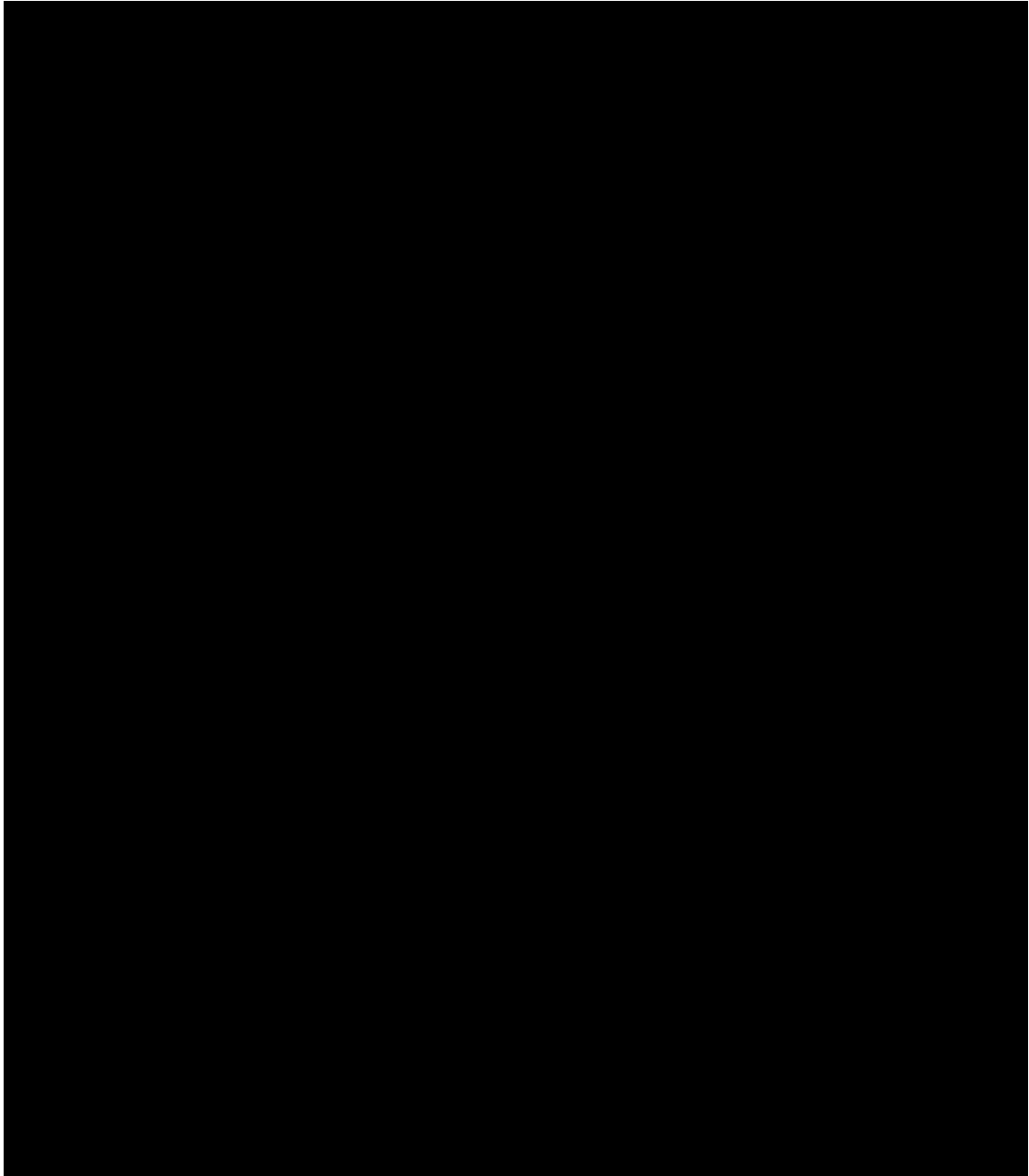
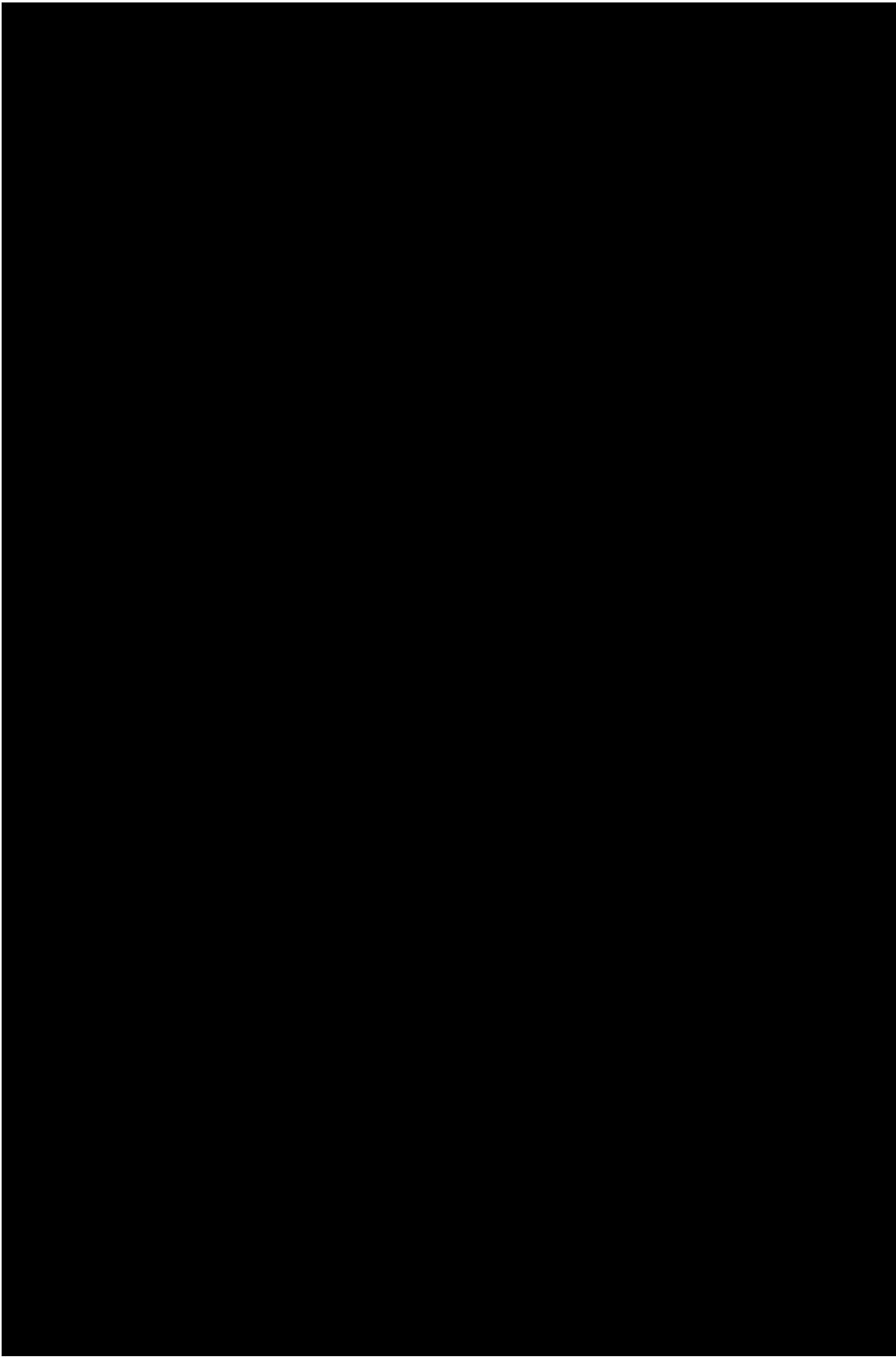


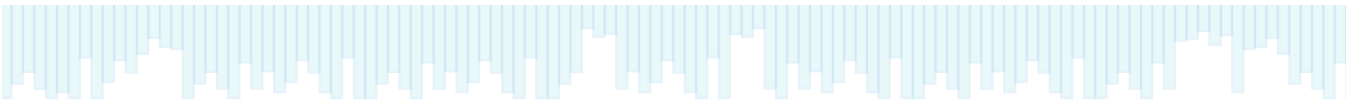
Formative Assessment

A. Fill in each blank with the correct word or words.

1. An unbiased estimator of the population variance is the _____.
2. The quantity $\frac{(n-1)s^2}{\sigma^2}$ has a _____ distribution.
3. The chi-square (χ^2) probability distribution has _____ degrees of freedom.





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- b. Construct 95% confidence intervals for the true variance and standard deviation of these computer chip part measurements and interpret.
- c. Is the design specification for this computer chip part satisfied? Why or why not?
5. A manufacturer of light-emitting diode (LED) bulbs wanted the mean life of the bulbs to last for 50 000 hours, and the variability to be small. Twelve bulbs produced the following lengths of life in hours.

21 000, 19 240, 25 100, 28 000, 22 500, 23 900,
28 500, 27 600, 33 000, 35 400, 20 900, 30 000

- a. What is the best point estimates for the population variance and standard deviation of the length of life of these LED bulbs?
- b. Construct 96% confidence intervals for the variance and standard deviation of the lengths of life of the LED bulbs manufactured by this company. Interpret.
- c. The manufacturer wished to control the variability of the length of life so that the standard deviation is less than 2000 hours. Based on the constructed 96% confidence interval, did the manufacturer achieve this goal? Justify your answer.
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