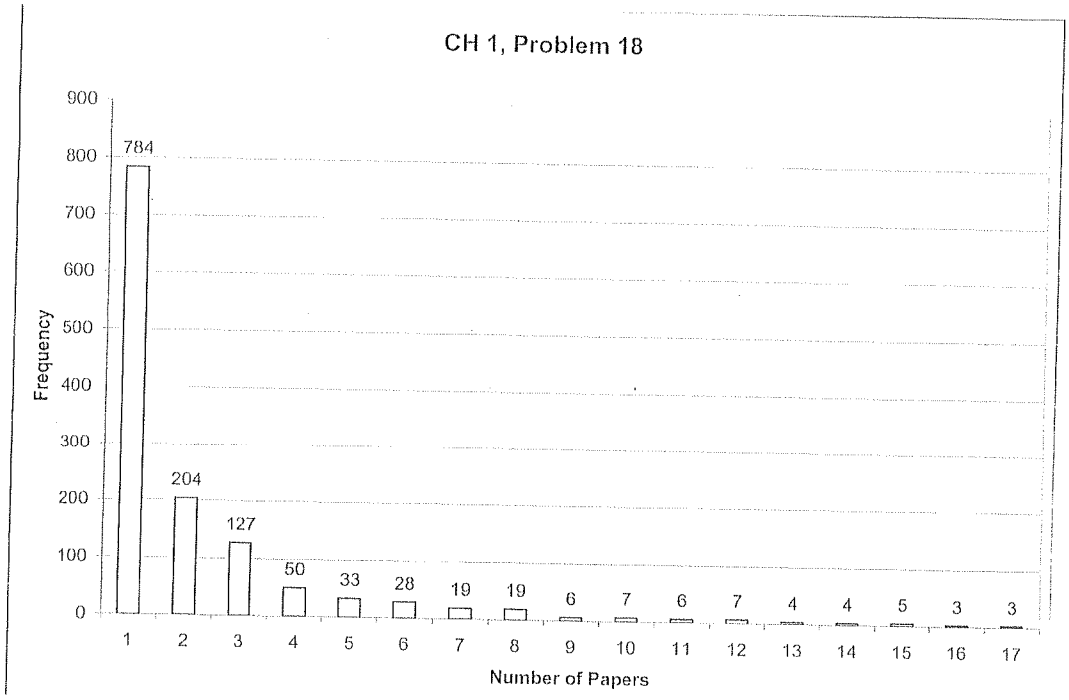
Lesson 1

(3) a. What is the probability that more than X need service?
What is the probability that fewer than Y need service?
What is the probability that between W and Z need service?

b. What proportion of computers (of this type) will need warranty service? What distribution governs this process?

(18)

a.



Quickly decays and then levels out – Exponential Distribution?

b.

$$P(x \geq 5) = \frac{\sum_{i=5}^{17}}{\sum_{i=1}^{17}} = \frac{33+28+19+\ldots+3+3}{784+204+\ldots+3+3} = 0.1100$$

$\boxed{11\%}$

$$P(x \geq 10) = \frac{7+6+\ldots+3+3}{784+204+\ldots+3+3} = 0.0298 \quad \boxed{2.98\%}$$

$$P(x > 10) = \frac{6+7+\ldots+3+3}{784+204+\ldots+3+3} = 0.0244 \quad \boxed{2.44\%}$$

c. The current bin size is 1 paper (1 column for each possible number of papers.) If you combine the number of papers in each column (increase bin size) you will need to be consistent and do that throughout the graph.

(33) a. mean $\Rightarrow \bar{x} = \frac{\sum x_i}{n} = \frac{2696}{14} = \underline{\underline{192.5714}}$

median $\Rightarrow \tilde{x} = \frac{187+191}{2} = \underline{\underline{189}}$

The mean is the average single-leg power measurement. The median is a measurement of the middle (or "most typical") measurement. (<u>Not</u> the "mode" $\Rightarrow$ most frequently occuring value.)

b. Mean decreases to 189.7143.
Median does not change.

c. By eliminating the highest and lowest observations, the trimmed mean is $\boxed{191.}$

Trim % $= \frac{1}{14} = 0.0714 \Rightarrow \boxed{7.14\ \%}$

d. $\bar{x}$ for $n=13$ is 119.7692

$(13)(119.7692) = 1556.9996$

$1556.9996 + 159 = 1715.9996$

$\frac{1715.9996}{14} = \boxed{122.5714}$

(44) a. Range $\Rightarrow$ high - low $= 49.3 - 23.5 = \boxed{25.8}$

b. $s^2 = \dfrac{\sum (x_i - \bar{x})^2}{n-1} = \boxed{49.3112}$

c. $s = \sqrt{s^2} = \boxed{7.0222}$

(51) a. $s^2 = \dfrac{\sum (x_i - \bar{x})^2}{n-1} = 1264.766 \text{ min}^2$

$s = \sqrt{s^2} = 35.5636 \text{ min}$

b. Since 60 min = 1 hour & 3600 min^2 = 1 hour^2,

$s^2 \Rightarrow \dfrac{1264.766 \text{ min}^2}{3600 \text{ min}^2} = 0.3513 \text{ hours}^2$

$s \Rightarrow \dfrac{35.5636 \text{ min}}{60 \text{ min}} = 0.5927 \text{ hours}$