

Week in Review–Additional Material sections 3.3 and 3.4

1. Type the values of X into L_1 , the frequency(cars) into L_2 , and then compute
1-Var Stats L_1, L_2

This is a sample. If your instructor did not talk about data being a sample then use the population results.

$$\text{sample variance} = 3.3698$$

$$\text{population variance} = 3.3661$$

$$\text{sample st. dev.} = 1.8357$$

$$\text{population st. dev.} = 1.8347$$

2. Type the values of X into L_1 , the frequency(students) into L_2 , and then compute
1-Var Stats L_1, L_2

This data is a population since the entire class is surveyed

$$\text{population variance} = 3.4251$$

$$\text{population st. dev.} = 1.8507$$

3. this is a binomial problem.
 $n = 500$, $p = 0.84$

$$\mu = n * p = 420 \text{ and } \sigma = \sqrt{n * p * q} = 8.19756$$

(a) 411, 412, 413, ..., 429

(b) 427, 428, 429, ..., 500

(c) $r = 404, 405, 406, \dots, 436$

$$\text{binomcdf}(500, 0.84, 436) - \text{binomcdf}(500, 0.84, 403)$$

$$\text{Answer: } 0.9562$$

4. a Chebychev's problem.

first find the value of k.

$$\mu + k\sigma = 24 + k * 3 = 28 \text{ or } k = \frac{4}{3}$$

The prob. that the hair dryers will last between 20 and 28 months is $\geq 1 - \frac{1}{\left(\frac{4}{3}\right)^2} = \frac{7}{16}$

5. a Chebychev's problem.

first find the value of k.

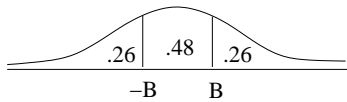
$$\mu + k\sigma = 36 + k * 4 = 30 \text{ or } k = 1.5$$

The prob. that the product will last between 30 months and 42 months is $\geq 1 - \frac{1}{1.5^2} = 0.5555555555 = \frac{5}{9}$

The number of items will be at least $9000 * \frac{5}{9}$ or at least 5000 items

6. (a) $\text{normalcdf}(0.3, 1.83, 0, 1) = 0.3485$
 (b) $\text{normalcdf}(-1E99, 1.5, 0, 1) = 0.9332$
 (c) 0
7. (a) $A = \text{invNorm}(.68, 0, 1) = 0.4677$

- (b) since 48% of the area is between $-B$ and B , this means that due to symmetry and the fact all probability adds up to one each outside piece is 26%, see the figure.



$$B = \text{invNorm}(.48 + .26, 0, 1) = 0.6433$$

8. (a) $\text{normalcdf}(32, 53, 40, 8) = 0.7893$
 (b) $\text{normalcdf}(45, 1E99, 40, 8) = 0.2660$
 (c) $\text{invNorm}(1 - .75, 40, 8) = 34.6041$
9. 1.3 standard deviations above the mean gives $x = 83 + 1.3 * 5 = 89.5$

$$P(X < 89.5) = \text{normalcdf}(-1E99, 89.5, 83, 5) = 0.9032$$

Answer: 90.32%

10. (a) $\text{normalcdf}(35000, 1E99, 40000, 2000) = 0.9938$
 (b) $800 * 0.9938 = 795.0322$ so approximately 795
 (c) $\text{normalcdf}(38000, 44000, 40000, 2000) = 0.8186$
 (d) This is a binom problem with success being a tire having a tread life between 38,000 and 44,000 miles. $N=4$, $p=0.8186$ (from part c), and $r=4$.
 $\text{binompdf}(4, 0.8186, 4)$
 Answer: 0.4490
 (e) This is a binom problem with success being a tire having a tread life between 38,000 and 44,000 miles. $N=4$, $p=0.8186$ (from part c), and $r=3$.
 $\text{binompdf}(4, 0.8186, 3)$
 Answer: 0.3980
11. (a) $\text{normalcdf}(-1E99, 7.2, 8, 0.5) = 0.0548$
 (b) $0.0548 * 300 = 16.44$ so approximately 16.