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.

   sample variance = 3.3698
   population variance = 3.3661

   sample st. dev. = 1.8357
   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

   population variance = 3.4251
   population st. dev. = 1.8507

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

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

   (a) 411, 412, 413, ...,429
   (b) 427, 428, 429, ..., 500
   (c) r=404, 405, 406, ...436
   binomcdf(500,0.84, 436) - binomcdf(500,0.84,403)
   Answer: 0.9562

4. a Chebychev's problem.

   first find the value of k.

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

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

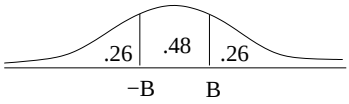
5. a Chebychev's problem.
   first find the value of k.
   $\mu + k\sigma = 36 + k * 4 = 30$ or $k = 1.5$

   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) normalcdf(0.3,1.83,0,1) = 0.3485
   (b) normalcdf(-1E99,1.5,0,1) = 0.9332
   (c) 0

7. (a) A = 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= invNorm(.48+.26,0,1) = 0.6433

8. (a) normalcdf(32,53,40,8) = 0.7893
   (b) normalcdf(45,1E99,40,8) = 0.2660
   (c) invNorm(1-.75,40,8) = 34.6041

9. 1.3 standard deviations above the mean gives $x = 83 + 1.3 * 5 = 89.5$

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

   Answer: 90.32%

10. (a) normalcdf(35000,1E99,40000,2000) = 0.9938
    (b) $800 * 0.9938 = 795.0322$ so approximately 795
    (c) 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.
    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.
    binompdf(4, 0.8186,3)
    Answer: 0.3980

11. (a) normalcdf(-1E99, 7.2,8,0.5) = 0.0548
    (b) $0.0548 * 300 = 16.44$ so approximately 16.