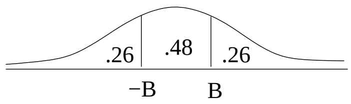
Week in Review–Additional Material sections 8.5 and 8.6

1. (a) normalcdf(0.3,1.83,0,1) = 0.3485
   (b) normalcdf(-1E99,1.5,0,1) = 0.9332
   (c) 0
2. (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

3. $z = \dfrac{x-\mu}{\sigma} = \dfrac{38-43}{4} = -1.25$
4. 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%
5. (a) normalcdf(32,53,40,8) = 0.7893
   (b) normalcdf(45,1E99,40,8) = 0.2660
   (c) invNorm(1-.75,40,8) = 34.6041
6. (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
7. (a) normalcdf(-1E99, 7.2,8,0.5) = 0.0548
   (b) $0.0548 * 300 = 16.44$ so approximately 16.

There are two different styles when approximating the Binomial Distribution. Be sure that your USE THE STYLE TAUGHT BY YOUR INSTRUCTOR.

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METHOD A: This is the method that is found in the textbook. All of these answers are computed using the 0.5 adjustment factor.

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8. Use the normal approximation to solve this problem. N=4000, p=.2 r = 0, 1, ...,749

   $\mu = np = 4000 * .2$ $\sigma = \sqrt{4000 * .2 * .8}$

   normalcdf$(-1E99, 749.5, 4000 * .2, \sqrt{4000 * .2 * .8})$= 0.0230

9. N=5000,p=0.03 so $\mu = np = 5000 * .03$ $\sigma = \sqrt{5000 * .03 * .97}$

   (a) r=115,116, 117,...,180
   normalcdf$(114.5, 180.5, 5000 * .03, \sqrt{5000 * .03 * .97})$ = 0.9926

   (b) r = 141, 142,...5000
   normalcdf$(140.5, 1E99, 5000 * .03, \sqrt{5000 * .03 * .97})$ = 0.7845

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METHOD B: This method is NOT found in the textbook. ONLY USE IT IF YOUR INSTRUCTOR HAS TAUGHT IT IN CLASS.

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8. Use the normal approximation to solve this problem. N=4000, p=.2 r = 0, 1, ...,749

   $\mu = np = 4000 * .2$ $\sigma = \sqrt{4000 * .2 * .8}$

   normalcdf$(-1E99, 749, 4000 * .2, \sqrt{4000 * .2 * .8})$= 0.0219

9. N=5000,p=0.03 so $\mu = np = 5000 * .03$ $\sigma = \sqrt{5000 * .03 * .97}$

   (a) r=115, 116, 117, ...,180
   normalcdf$(115, 116, 5000 * .03, \sqrt{5000 * .03 * .97})$ = 0.9917

   (b) r = 141, 142,...5000
   normalcdf$(141, 1E99, 5000 * .03, \sqrt{5000 * .03 * .97})$ = 0.7722