Corrections to HW 6
Econ 29000
Kevin R Foster, CCNY

Apologies – I really screwed up a couple of the questions for HW 6 with typos (corrections in red). The only good news is that I don't count your scores against you – so many people did really well in the grading.

1. For a Standard Normal, what is the area to the left of -2?
   NORMSDIST(-2) = 0.0228.
2. For a Standard Normal, what is the area to the right of 0.75?
   This is the same as the area to the left of -0.75, so NORMSDIST(-0.75) = 0.2266; alternately 1 – NORMSDIST(0.75).
3. For a Standard Normal, what is the area to the left of 1?
   NORMSDIST(1) = 0.8413.
4. For a Standard Normal, what is the area within one standard deviation?
   The area nearer to zero than one standard deviation can be found by calculating the area in the tail to the left of -1, NORMSDIST(-1) = .1587. Multiply by two so the area in both tails beyond one standard deviation is .3173. Thus the area between the tails is 1 - .3173 = .6827.
5. For a Standard Normal, what is the area within two standard deviations?
   The area to the left of -2 is NORMSDIST(-2) = 0.228 so the area in both tails is 0.0455, thus the remaining area is 0.9545.
6. For a Standard Normal, what range around the mean has area of 0.95?
   This is almost ±2 but a bit less; experiment or use NORMSINV to ask what value leaves just 0.025 area in the left tail (since both tails would combine to 5%). NORMSINV(0.025) = -1.96. So the range is ±1.96.
7. For a Standard Normal, what range around the mean has area of 0.90?
   This will be smaller than 1.96; again can experiment or NORMSINV(0.05) = -1.65 so the range is -1.64 so the range is ±1.64.
8. For a Normal with mean zero and standard deviation 10, what area is to the left of 5?
   Standardize to get $Z = \frac{x-\mu}{\sigma}$, where μ is given as zero and σ is given to be 10, so $Z = \frac{5-0}{10} = \frac{1}{2} = 0.5$. So the area, under a standard normal, to the left of 0.5, is NORMSDIST(0.5) = .6915.
9. For a Normal with mean zero and standard deviation 10, what area is to the right of 7?
   Calculate $Z = \frac{7-0}{10} = \frac{7}{10} = 0.7$ so the area, under standard normal, to the right of 0.7, is 1 – NORMSDIST(0.7) = 0.2420.

10. For a Normal with mean zero and standard deviation 10, what area is to the left of 15?

    Calculate $Z = \frac{15-0}{10} = \frac{15}{10} = 1.5$ so the area, under standard normal, to the left of 1.5, is 0.9332.

11. For a Normal with mean zero and standard deviation 10, what distance from the mean contains area 0.95?

    We found above that a range of ±1.96 contains 95% of the area, under a standard normal distribution. So we just want to reverse the equation above since now we know Z and want to find x, from $Z = \frac{x-\mu}{\sigma}$, $1.96 = \frac{x-0}{10}$, so the range is ±19.6.

12. For a Normal with mean 5 and standard deviation 4, what area is to the left of zero?

    Calculate $Z = \frac{0-5}{4} = -\frac{5}{4} = -1.25$, so the area, under the standard normal, to the left of -1.25, is NORMSDIST(-1.25) = .1056.

13. For a Normal with mean 5 and standard deviation 4, what area is to the left of 10?

    Calculate $Z = \frac{10-5}{4} = \frac{5}{4} = 1.25$, so the area, under the standard normal, to the left of 1.25, is NORMSDIST(1.25) = .8944.

14. For a Normal with mean -9 and standard deviation 2, what area is to the left of -7?

    Calculate $Z = \frac{-7-(-9)}{2} = \frac{2}{2} = 1$, so the area, under the standard normal, to the left of 1, is NORMSDIST(1) = .8413.

15. For a Normal with mean -9 and standard deviation 2, what area is to the left of -10?

    Calculate $Z = \frac{-10-(-9)}{2} = -\frac{1}{2} = -0.5$, so the area, under the standard normal, to the left of 1, is NORMSDIST(-0.5) = .3085.