

223 Normal Distribution Practice Key

(1)

1a. $P(z < 1.4) = \text{normalcdf}(-E99, 1.4) = .91924$

b. $P(z \leq -3) = \text{normalcdf}(-E99, -3) = .0044$

c. $P(z > 1.9) = \text{normalcdf}(1.9, E99) = .0287$

d. $P(z \geq -1.6) = \text{normalcdf}(-1.6, E99) = .9452$

e. $P(|z| > 2.1) = 2 * \text{normalcdf}(2.1, E99) = 2(.01786) = .03572$

f. $P(|z| \leq .5) = \text{normalcdf}(-.5, .5) = .38292$

g. $P(-.7 < z < 1.8) = \text{normalcdf}(-.7, 1.8) = .7221$

2a. $P(x > 58, \mu = 64, \sigma = 3.1) = \text{normalcdf}(58, E99, 64, 3.1) = .9735$

b. $P(x < 72, \mu = 69, \sigma = 3.3) = \text{normalcdf}(E99, 72, 69, 3.3) = .8183$

c. $P(81 \leq x \leq 120, \mu = 100, \sigma = 15) = \text{normalcdf}(81, 120, 100, 15) = .80615$

d. $P(x < 20 \text{ or } x > 30, \mu = 21.6, \sigma = 5.2) = 1 - \text{normalcdf}(20, 30, 21.6, 5.2) = .43227$

3a. $P(z < z) = .31 \Rightarrow \text{invNorm}(.31) = -.49585 = z$

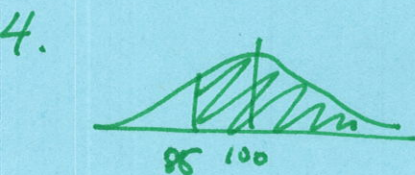
b. $P(z > z) = .44 \Rightarrow \text{invNorm}(1-.44) = .150969 = z$

c. $P(|z| > z) = .15 \Rightarrow \text{invNorm}(\frac{.15}{2}) = 1.43 \Rightarrow z = \pm 1.43$

d. $P(|z| < z) = .75 \Rightarrow \text{invNorm}(\frac{1-.75}{2}) = -1.15 \Rightarrow z = \pm 1.15$

e. $P(x > 86, \mu = 100, \sigma = 20) = .75 \Rightarrow \text{invNorm}(\frac{1-.75}{2}, 100, 20) = 86.51$

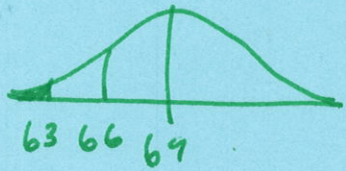
f. $P(x < 74, \mu = 69, \sigma = 3.3) = .95 \Rightarrow \text{invNorm}(.95, 69, 3.3) = 74.4$



$100 - 68 = \frac{32}{2} \Rightarrow 16\% \text{ below}$
 $84\% \text{ above}$

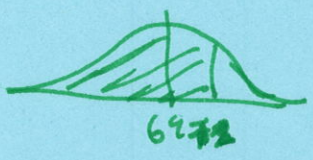
Verify $\text{normalcdf}(86, E99, 100, 8)$

5.



$100 - 95 = 5 \Rightarrow$
 $2.5\% \text{ below } \frac{5}{2}$ verify normalcdf (-E99, 63, 69, 3)

6.



84% (inverse of #4)
 verify normalcdf (-E99, 72, 69, 3)

7a. invNorm (.85, 1498, 199) = 1704

b. invNorm (.85, 21.6, 5.2) = 27

8. normalcdf (.88, E99, .63, .11) = .01152