SOLUTIONS

Quiz 7, March 7, 2012
Introduction to Probability - MATH/STATS 425, Winter 2012

Blood pressure of adults is normally distributed with mean 110 and standard deviation 10. Blood pressure is classified as normal if falls within 110 ± 12.8 range. Two aduts come for an office visit independently from each other. What is the probability that at least one of them has an *abnormal* blood pressure?

(You may round off the table values to the first leading digit. For example, round off .7834 to .8)

let X = blood pressure of a random adult.
$X \sim N(110, 10^2)$.

- $P\{\text{normal pressure}\} = P\{110-12.8 \le X \le 110+12.8\}$

$$= P\left\{-1.28 \le \frac{X-110}{10} \le 1.28\right\}$$

$$= \Phi(1.28) - \Phi(-1.28)$$

$$= 2\Phi(1.28) - 1 \approx 2 \times 0.9 - 1 = 0.8.$$

- $P\{\text{both patients have normal pressure}\} = 0.8^2 = 0.64$ (by independence)
- $P\{\text{at least one has abnormal pressure}\} = 1 - 0.64 = \boxed{0.36}$