Name: Key Section (Circle One): 8:00 - 8:50 10:00 - 10:50

Math 110 Supplemental Instruction Worksheet 7

1. Records from a particular bank show that 65% of car loan applications are approved. Suppose 15 car loan applications are selected at random.

   (a) Find the probability that exactly seven of the applications are approved.

success: loan approved

n = # trials = 15

$x = 7$

$p = .65$

$p(7 \text{ approved}) = C(15,7) \cdot (.65)^7 (1-.65)^{15-7}$

$= C(15,7)(.65)^7(.35)^8$

$= .071$

(b) Find the probability that at least three applications are approved?

p(at least three approved) = 1 − p(0, 1 or 2 approved)

$x=0$ $C(15,0)(.65)^0(.35)^{15}$

$= .000000145$

$x=1$ $C(15,1)(.65)^1(.35)^{14}$

$.00000404$

$x=2$ $C(15,2)(.65)^2(.35)^{13}$

$= .0000524$

sum: $.00005665$

p(at least 3) = 1 − .00005665

= .99994.

2. Suppose a six-sided die is rolled 10 times. What is the probability that you will roll at least one six?

success: roll six

$n = 10$

x = at least one

$p = \frac{1}{6}$ [prob of six in single trial]

$p(\text{at least one six}) = 1 - p(\text{no six})$

$= 1 - .1615 = .838$

$p(\text{no six}) = C(10,0)\left(\frac{1}{6}\right)^0\left(\frac{5}{6}\right)^{10}$

$= .1615$

3. Suppose you play a game where you must draw eight cards, each time recording you card and then replacing it. What is the probability that all eight cards were spades?

success: spade

$n = 8$

$x = 8$

$p = \frac{13}{52} = \frac{1}{4}$

$p(\text{all spades}) = C(8,8)\left(\frac{1}{4}\right)^8\left(\frac{3}{4}\right)^0 = .0000153.$