No. Chapter 6 B

1 Evaluate P(4 < X < 8) for binomial variable with:

n= 12 p= 40%

a) Using tables for the binomial distribution

b) Using the normal distribution approximation

2 Components shipped include 0.5% defectives. You plan to select 80 items; if 0 are defective, you will assume all are okay. [Using normal approximation to binomial],

a) Find the probability that you will find 0 defectives in 80 items.

b) Find the probability you will find none if p = 1.5%

3 P(recovery) = 85%. Of the next 70 patients treated with the procedure, what is the probability that:

a) Between 55 and 63, inclusive, will survive?

b) Fewer than 63 will survive?

4 If 25% prefer white telephones, what is the probability that among next 800:

a) between 175 and 185, inclusive, will choose white

b) At least 215, but not more than 220 ?

5 15% of male freshman are from out of state. Males are assigned randomly to dorms, 180 to a building. What is the probability that in a given dorm more than 20% are out of state?

6 10% of drivers are drunk. If 240 are tested at random for intoxication, what is the probability that that the number caught will be:

a) Less than 20 ?

b) More than 30 ?

c) If $x \geq 24$ and $x \leq 30$:

7 If 10% of parts are defective, then In a lot of 55, what is the probability:

a) More than 4 items will be defective?

b) More than 8 items will be defective?

8 Serum cholesterol level in boys has an approximately normal distribution but is determined to the nearest whole number. Given the mean and variability listed below.

Extra (not assigned)

a) Find the probability that randomly chosen boy has a level that exceeds 230

Cholesterol is continuous with a normal distribution, so

$\mu = 170$ $\sigma^2 = 900$ $\sigma = 30$

$x_1 > 230$

$P(x > 230) = 1 - P(x < 230.5)$

$$Z_1 = \frac{X_1 - \mu}{\sigma} = \frac{230.5 - 170}{30} = \frac{60.50}{30.00} = 2.017$$

$P(Z < Z_1) = 0.97813$ $P(Z > Z_1) = \mathbf{0.022}$

b) Find probability that more than 8 out of 300 will have level above 230:

Now it is binomial since count of number of boys

$p = 0.0219$ from previous step

$\mu = np = 300 \times 0.022 = 6.560$

$\sigma^2 = npq = 6.4161$ $\sigma = 2.533$

$x_1 = 8.5$ since ≥ 8

$P(x > 8) = 1 - P(x < 8.5)$

$$Z_1 = \frac{X_1 - \mu}{\sigma} = \frac{1.94}{2.53} = 0.766$$

$P(x > 8) = 1 - P(x < 8.5) = 1 - 0.778 = \mathbf{0.222}$

1

a) 50.5%

b) 51.4%

2

a) 48.6%

b) 20.1%

3

a) 86.3%

b) 84.2%

4

a) 10.0%

b) 1.1%

5	2.4%

6

a) 16.6%

b) 8.1%

c) 46%

7

a) 67.3%

b) 8.9%

