

SOLUTIONS TO THE CUMULATIVE 2 REVIEW SHEET

Unit 5

1.

Roll	x	P(x)
1	-1	1/6
2	4	1/6
3	-9	1/6
4	16	1/6
5	-25	1/6
6	36	1/6

$$E(x) = 1/6(-1+4-9+16-25+36) = 3.5 \quad \text{win } \$3.50$$

2. $p=0.4 \quad q=0.6$

$$b(45; 50, 0.4) = C(50,45)(0.4)^{45}(0.6)^5 = 2.04 \times 10^{-13}$$

$$E(x) = np = 50(0.4) = 20$$

3. $P(x) = (.9)^7(.1) = 0.05$
 $E(x) = .9/.1 = 9$

4. $P(x) = [C(5,2) \times C(10,1)] / C(15,3) = 0.2198$
 $E(x) = (3 \times 5) / 15 = 1$

Unit 6

1. a) $z = (10 - 10.35) / 0.2 = -1.75$
 $A(z) = 0.0401$
- b) $z = (10.5 - 10.35) / 0.2 = 0.75$
 $A(z) = 0.7734$
 $P(x) = 1 - 0.7734 = 0.2266$
- c) need two z scores
 $z = -0.5$ and $z = 1.5$ giving us $A(z)$ of 0.3085 and 0.9332
 Then we subtract these to get 0.6247

2. $P(x < 10)$ ---- we must do $P(x < 9.5)$

$$np = 7$$

$$\text{st dev} = 2.60$$

$$z = 0.96 \quad \text{and } A(z) = 0.8315$$

3. Hypothesis Test

$$\text{null: mean} = 5100$$

$$\text{alternate: mean} > 5100$$

$$\alpha = 0.05$$

$$P(z > (5300 - 5100) / (150 / \sqrt{10}))$$

$$= 1 - 0.9986$$

$$= 0.0014 < 0.05$$

Therefore accept the alternate hypothesis

$$4. \quad .85 - 1.645(\sqrt{(.85)(.15)}) / \sqrt{200} < p < .85 + 1.645(\sqrt{(.85)(.15)}) / \sqrt{200}$$
$$.81 < p < .89$$

$$5. \quad n = 4pq(z/w)^2$$
$$= 4(.5)(.5)(1.645/.04)^2$$
$$= 1691.3$$

Therefore survey 1692 people.