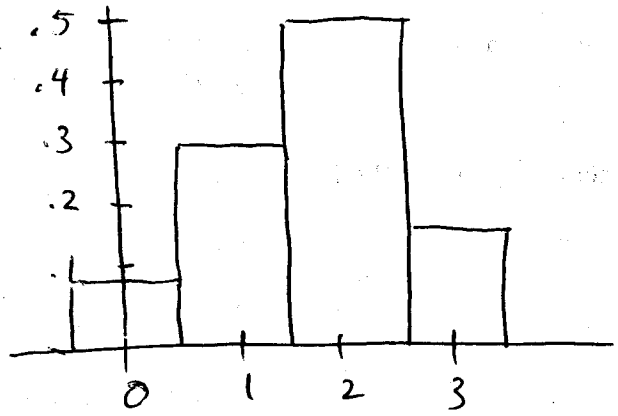
MATH 110 - EXAM 4 - SOLUTIONS

1. (a)

# in line	# occurrences	rel. frequency
0	8	$8/96 = .08$
1	28	$28/96 = .29$
2	46	$46/96 = .48$
3	14	$14/96 = .15$

(b)



(c)

$$\overline{x} = (0)\left(\frac{8}{96}\right) + (1)\left(\frac{28}{96}\right) + (2)\left(\frac{46}{96}\right) + (3)\left(\frac{14}{96}\right)$$

$$= \frac{162}{96} = 1.6875 //$$

2. (a) X = #bullseyes in 8 throws

$$\Pr(X=6) = \binom{8}{6}\left(\frac{3}{5}\right)^6\left(\frac{2}{5}\right)^2$$

$$= \left(\frac{8\cdot 7}{2}\right)(.6)^6(.4)^2$$

$$\cong .209 \;//$$

(b) $\Pr(X=6) + \Pr(X=7) + \Pr(X=8)$

$$= \binom{8}{6}(.6)^6(.4)^2 + \binom{8}{7}(.6)^7(.4)^1 + \binom{8}{8}(.6)^8(.4)^0$$

$$\cong .209 + .090 + .017$$

$$= .316 \;//$$

3. X = earnings (in dollars)

(a) $E(X) = (-1)\left(\frac{1}{16}\right) + \left(-\frac{1}{2}\right)\left(\frac{1}{2}\right) + \left(\frac{1}{2}\right)\left(\frac{3}{8}\right) + (1)\left(\frac{1}{16}\right)$

$= -\frac{1}{16} - \frac{1}{4} + \frac{3}{16} + \frac{1}{16} = -\frac{1}{16}$ // $= 6.25¢$

(b) expected earnings would be about

$(500)\left(\frac{1}{16}\right) = \$31.25$ //

4. (a) $E(X) = (-1)(.4) + (1)(.3) + (2)(.3)$

$= -.4 + .3 + .6 = .5$ //

(b) $Var(X) = (-1-.5)^2(.4) + (1-.5)^2(.3) + (2-.5)^2(.3)$

$= 1.65$ //

$\sigma = \sqrt{Var(X)} = \sqrt{1.65} \approx 1.28$ //

(c)

k^2	$Pr(Y = k^2)$
1	.7
4	.3