HOMEWORK #5

Marked out of (40)

1. a) $E(X) = -5 \times 0.579 + 5 \times 0.347 + 10 \times 0.069 + 60 \times 0.05$
$= -0.17$ (2)

$sd(X) = \sqrt{(-5+0.17)^2 \cdot 0.579 + (5+0.17)^2 \cdot 0.347 + (10+0.17)^2 \cdot 0.069 + (60+0.17)^2 \cdot 0.005} = 6.930$ (2)

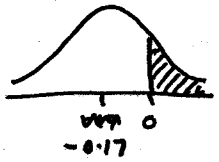
$P(\text{positive return}) = 0.347 + 0.069 + 0.005 = 0.421$ (2)

b) i) $E(\bar{X}) = -0.17$ (2)

$sd(\bar{X}) = \frac{sd(X)}{\sqrt{n}} = 0.693$ (2)

ii) Normal distribution, Central Limit Theorem (2)

iii)



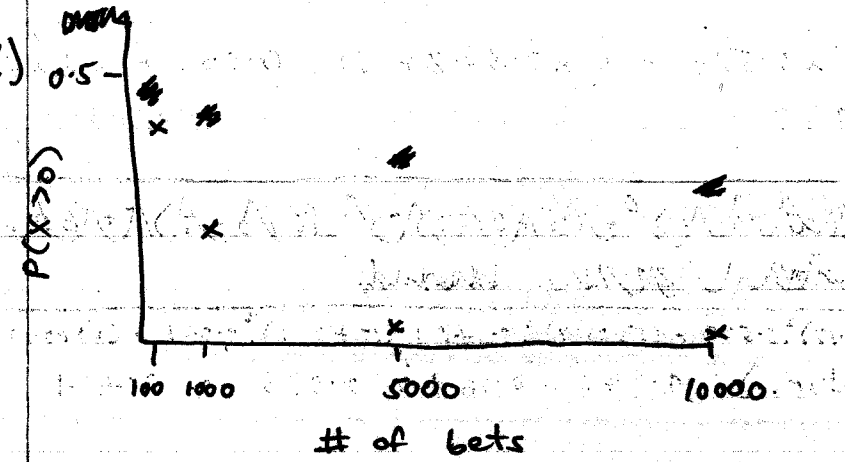
$z = \frac{0 + 0.17}{0.693} = 0.25$

$P(X > 0) = 1 - 0.599 = 0.401$ (3)

c)

1000:	5000:	10000:
i) $E(\bar{X}) = -0.17$ (2)	$E(\bar{X}) = -0.17$ (2)	$E(\bar{X}) = -0.17$ (2)
$sd(\bar{X}) = 0.219$ (2)	$sd(\bar{X}) = 0.098$ (2)	$sd(\bar{X}) = 0.069$ (2)
ii) $z = \frac{0+0.17}{0.219} = 0.78$	$z = \frac{0+0.17}{0.098} = 1.73$	$z = \frac{0+0.17}{0.069} = 2.46$
$P(X>0) = 1 - 0.782$ (2)	$P(X>0) = 1 - 0.958$ (2)	$P(X>0) = 1 - 0.993$ (2)
$= 0.218$	$= 0.042$	$= 0.007$

d)



(4)

Plot shows that as you increase the # of bets the prob of making a positive return decreases.

(3)

Stat 13 HW_5_2

(a) se(x1-x2) = square root(S_1^2/n_1+ S_2^2/n_2)
= square root(1.82^2/53+1.53^2/60)
= 0.3186

(b) The 2-standard-error interval is 7.90-4.30±2×0.3186=[2.96, 4.24]

(c) As this interval is well away from zero, sexual content seems to make a difference. The true mean number of correctly remembered brands under these conditions is likely to be greater when sexual content is present by somewhere between 3.0 and 4.2 brands than when it is absent. There is too little information for us to criticize the experiment. We would hope, however, that the complete set of students was split into two groups at random.