HW 6.1 Part B pages 354-355 problems 14, 18, 19, 23, 24, 27-30

(14) a)

Age @ death	21	22	23	24	25
Prof.t	-$99,750	-$99,500	-$99,250	-$99,000	-$98,750
Probability	.00183	.00186	.00189	.00191	.00193

Age @ death	26 or more
Prof.t	$1,250
Probability	.99058

b) in table above (.99058)

c) $\mu_X = \$-99750(.00183) + -\$99,500(.00186) + -\$99,250(.00189) + \$-99,000(.00191) + -\$98,750(.00193) + \$1,250(.99058)$

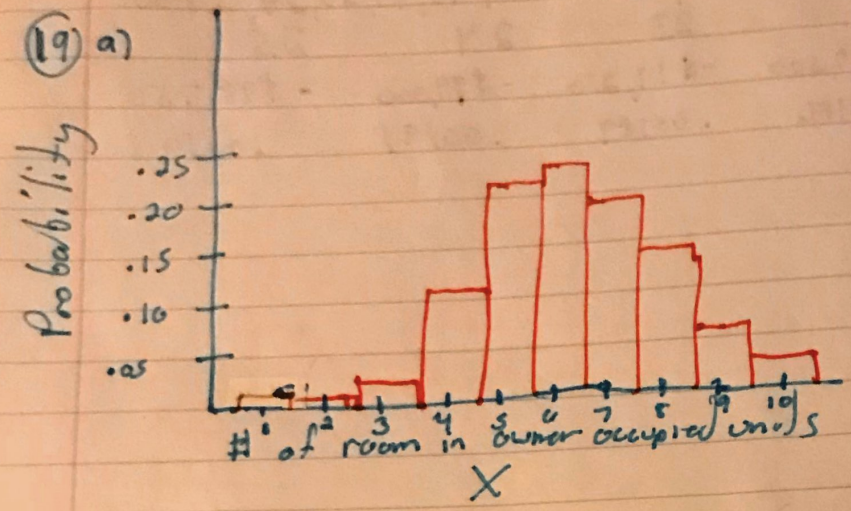
$\mu_X = \$303.35$

Over the long run, the company earns an average of $303.35 on a life insurance policy.

(18) a) Even though the company will lose a lot of money on a small # of policyholders who die, it will gain a small amount from many thousands of 21 year old men. In the long run, the insurance company can expect to make $303.35 on average per insurance policy.

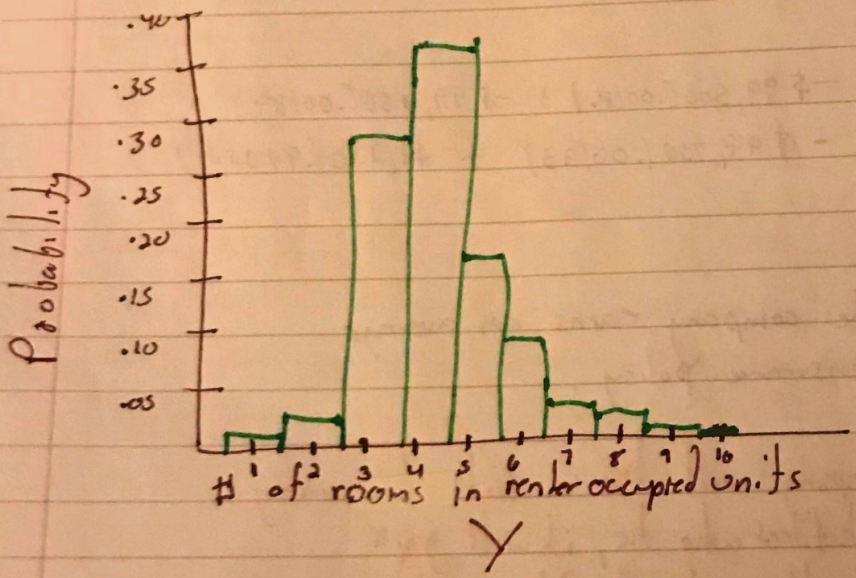
b) $\sigma_X = \$9707.57$ (use calculator)

(19) a)



This distribution (owner occupied) is roughly symmetric, while the one below (renter occupied) is skewed right right.

Renter Occupied units tend to have fewer rooms overall compared to owner occupied units.



b) $\mu_X = 6.284$ rooms (owner occupied) $\mu_Y = 4.187$ rooms (renter occupied)

This makes sense b/c the owner occupied units tends to have more rooms than the renter occupied units.

c) $\sigma_X = 1.6339$ rooms (owner occupied) $\sigma_Y = 1.3077$ rooms (renter occupied)

We expect owner occupied units distribution to have a slightly wider spread than renter occupied distribution. Even though renter occupied is skewed right, it is more concentrated (less variability) about the "peak" than the symmetric distribution for owner occupied units.

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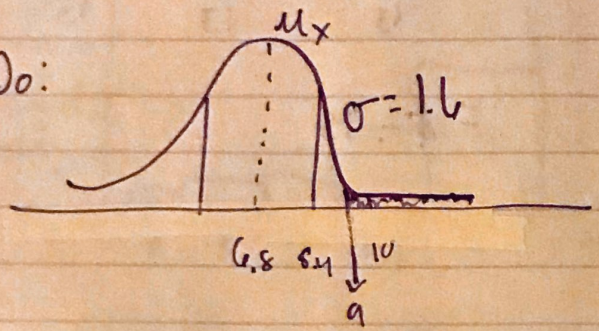
(23) X: score of Iowa Test of Basic skills for a randomly selected student
$N(6.8, 1.6)$ $P(x \geq 9)$

State: What is the probability that a randomly chosen student scores a 9 or higher on the ITBS?

Plan: The score X of the randomly chosen student has $N(6.8, 1.6)$ We want to find $P(x \geq 9)$

Do:



normalcdf (9, 10,000, 6.8, 1.6)
= .08

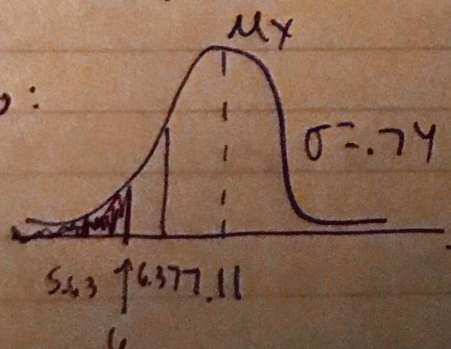
Conclude: There is about an 8% chance that the chosen student's score is 9 or higher. $P(Y \leq 6)$

(24) Y = time of a randomly selected male student at Univ. of Ill.

State: What is the probability that a randomly chosen student runs the mile in under 6 minutes?

Plan: The time Y of the randomly chosen student has $N(7.11, .74)$ We want to find $P(Y < 6)$

Do:



normalcdf (-10,000, 6, 7.11, .74)
= .067

There is a bout a 6.7% chance that the chosen student will run the mile under 6 minutes.