$y = \hat{\beta}_0 + \hat{\beta}_1 \bar{x}$ plug in $\bar{x}$ for x

$= \bar{y} - \hat{\beta}_1 \bar{x} + \hat{\beta}_1 \bar{x}$

$= \bar{y} + \hat{\beta}_1 (\bar{x} - \bar{x})$

$= \bar{y}$

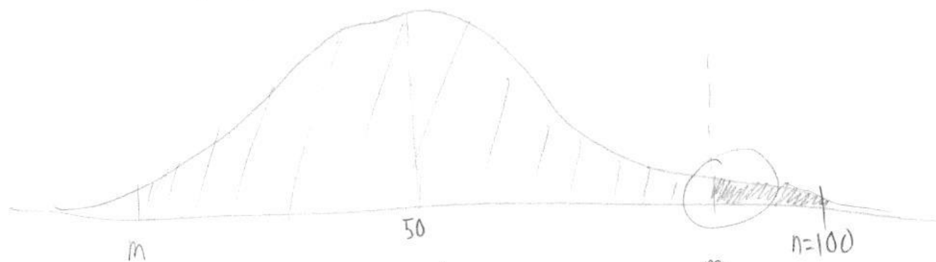
$y = \bar{y}$ $\boxed{\checkmark}$

$b(n,p,k) = \binom{n}{k} p^k (1-p)^{n-k}$ = exact #successes

$n = 100$

$\alpha(p) = \sum_{m \le k \le n} b(n,p,k)$

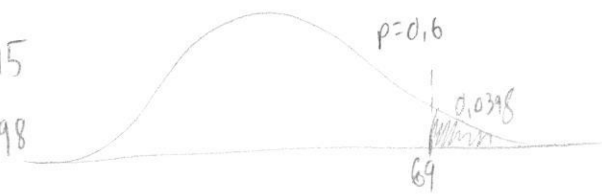
3.11



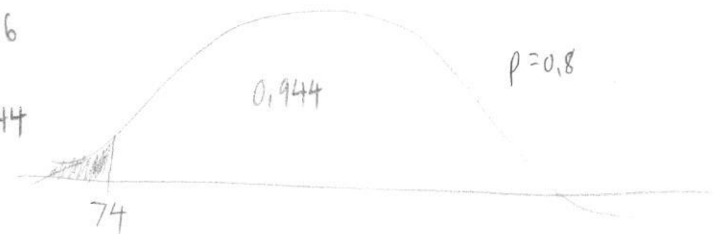
if m low, (equivalent to high alpha level)
harder for missed opportunity
$\alpha(p)$ becomes higher
T2 error $= 1 - \alpha(p)$
becomes lower

If m high, (equivalent to low alpha level)
harder for false alarm
T1 error goes down
$\alpha(p)$ becomes lower

T1 error
$\sum_{\underline{68} \le k \le 100} b(100, \underline{0.6}, k) = 0.0615$
$\sum_{\underline{69} \le k \le 100} b(100, \underline{0.6}, k) = 0.0398$



T2 error
$\sum_{\underline{73} \le k \le 100} b(100, \underline{0.8}, k) = 0.966$
$\sum_{\underline{74} \le k \le 100} b(100, 0.8, k) = 0.944$



For T1 error, m at 69 gives us < 5% error rate. We would reject H_0 at this point.
Increasing m will only decrease this rate further.

For T2 error, m at 73 gives us < 5% error rate. The new H_0 is $p = 0.8$. If the baseline is $p = 0.8$, then getting $m = 73$ or below would make us think $p = 0.6$, hence causing Type 2 error.
Decreasing m will only decrease this rate further.

This is why $69 \le m \le 73$.