

(like rule the)
 D. Recursion Section #2

R. 63
 6p
 AM57
 26 Oct 99

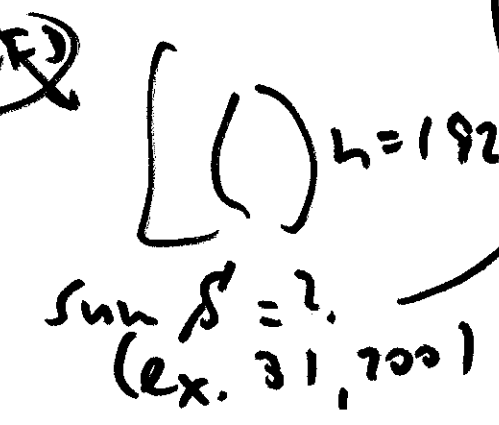
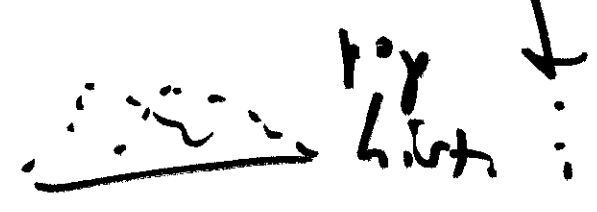
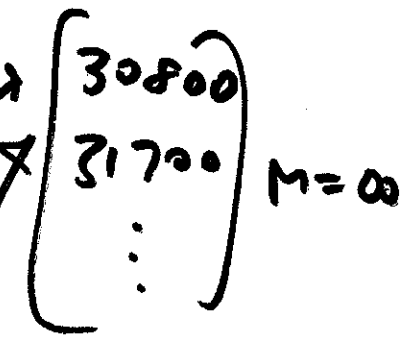
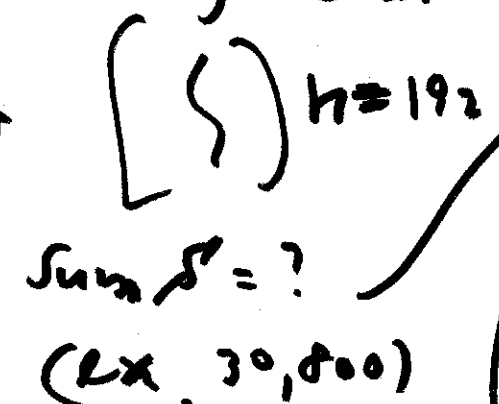
map
 all London
 underground
 riders of rush
 hr.
 weight

sample
 the observed
 people
 weight (lb.)

large data
 all possible
 sum ✓



mean $\mu = 158$ lb.
 s) $\sigma = 33$ lb.



low var [1] expected value
 mean of $S' = 30336$
 low standard error
 SD of $S' = 45713$

low var list [3]

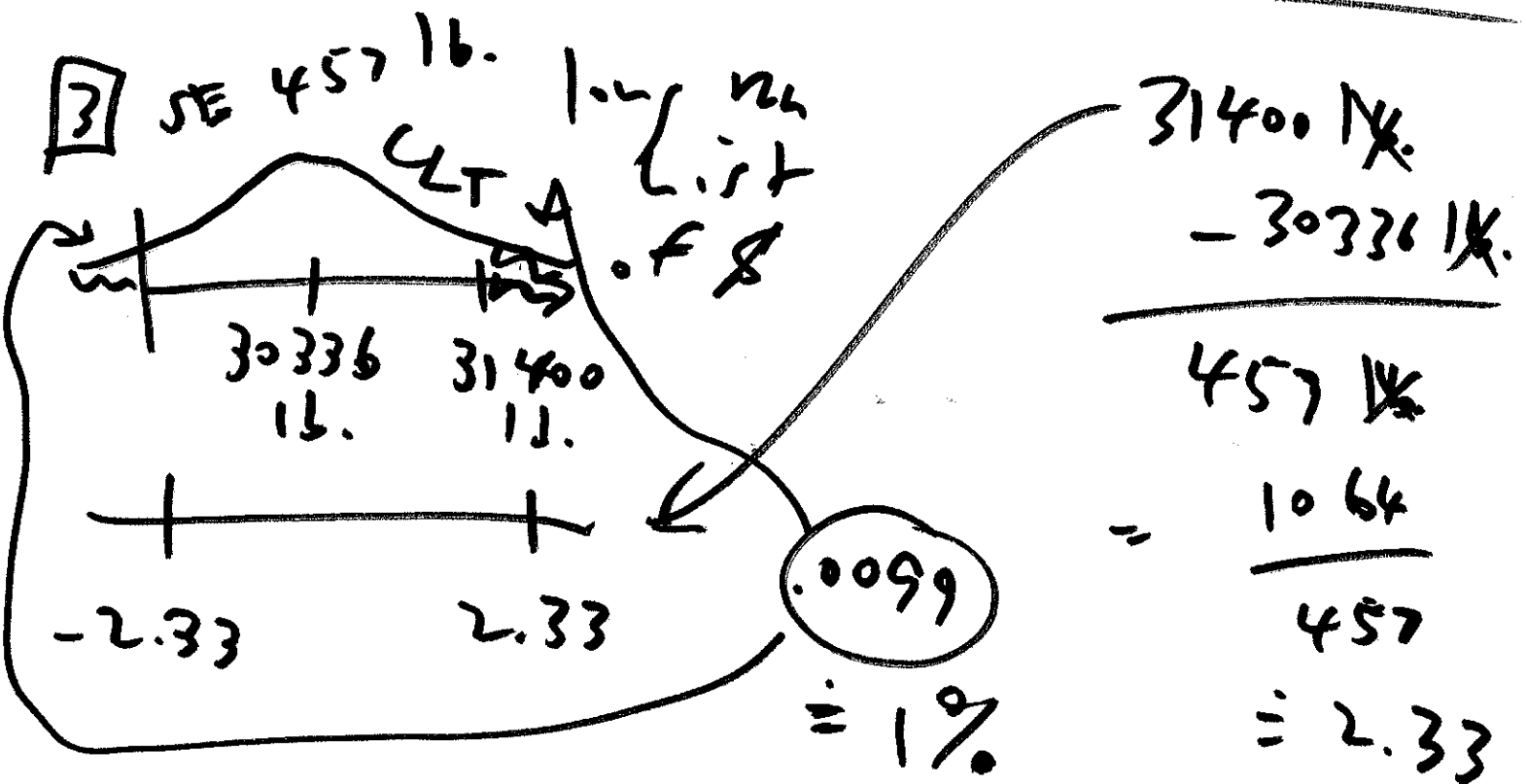
[1] EV of $S' = E_{IID}(S')$
 $= n/\mu = (192)(15816) = 30336$ lb.

[2] SE of $S' = SE_{IID}(S') = \sigma\sqrt{n}$
 $= 3316 \sqrt{192} = 457$ lb.

$SE(\bar{y}) = \frac{\sigma}{\sqrt{n}}$

$$P(\text{overload}) = P(\bar{X} > 31,400) = ?$$

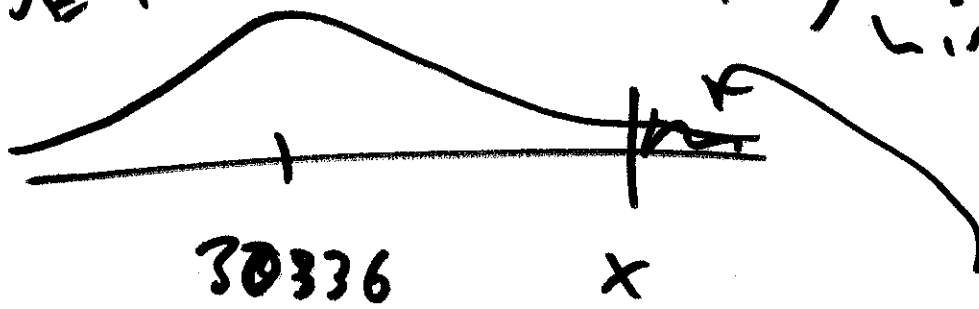
you get a nice normal curve in many datasets if pop is normal or if n is big (CLT); how big? A: experience & simulation



90 fully loaded trips / day so escalator would fail about once
 we $\frac{100}{90} \approx 1.1$ days (too often)

SE 457 lb.

low, min limit of σ



$.01\% = 0.0001$

Solve for x ,

$$3.72 = \frac{x - 30336}{457}$$

$$x = 30336 + 3.72 (457)$$

$$= 32036 \text{ lb.}$$

design tolerance	failure rate
31400 lb.	1%
32036 lb.	0.01%

even here it would fail about every 10000 days!
 so
 111 days