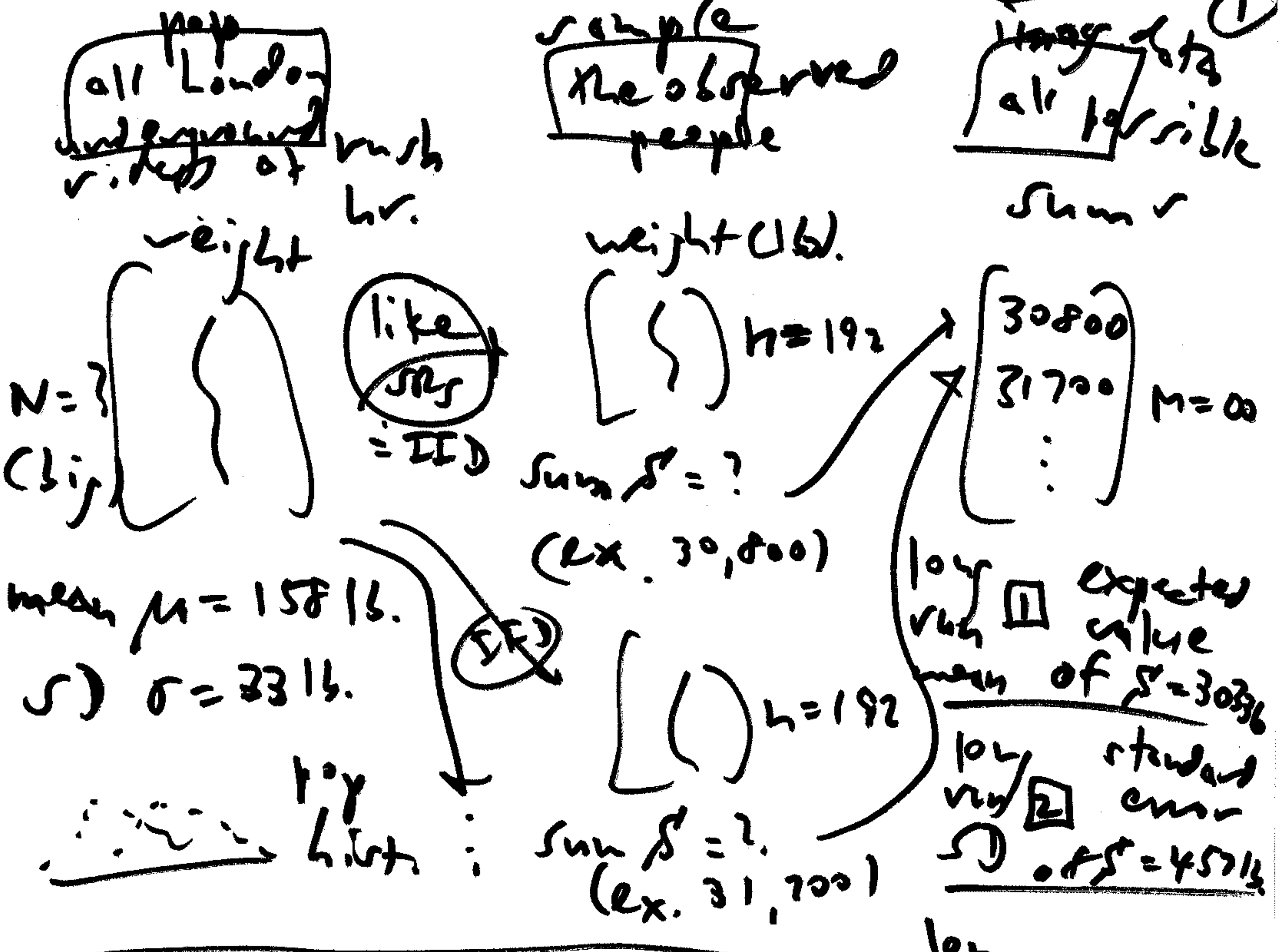
(like roulette)

Discussion Section #2 (R. 67 – 68) AMS 7 26 Oct 09

①



1 EV of $S = E_{IID}(S)$

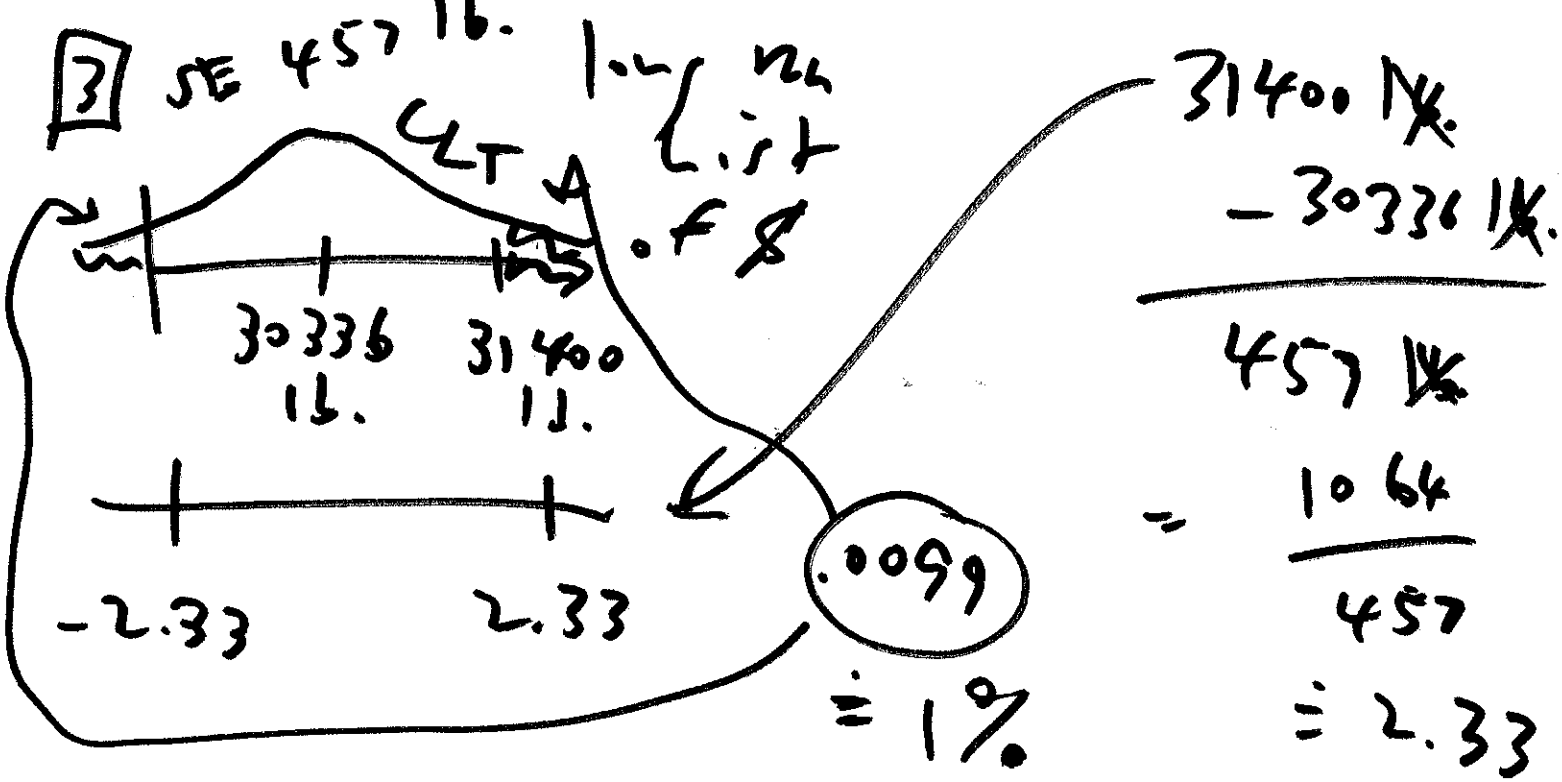
$= n\mu = (192)(158\text{ lb}) = 30336\text{ lb.}$

2 SE of $S = SE_{IID}(S) = \longrightarrow \sigma\sqrt{n}$

$= 33\text{ lb}\sqrt{192} = 457\text{ lb.}$ $\quad SE(\bar{y}) = \frac{\sigma}{\sqrt{n}}$

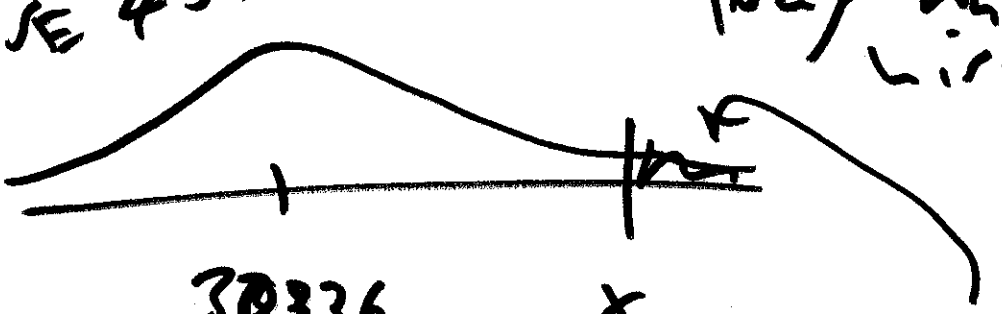
$P(\text{overload}) = P(S > 31{,}400) \overset{?}{=}$

you get a nice normal curve in any dataset if p is normal or if n is big (CLT); diff how big? A: experience & simulation



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

SE 457 lb.



.01% = 0.0001

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

Solve for x,

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

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

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

even here it would fail about every $\frac{10000}{90}$ = 111 days