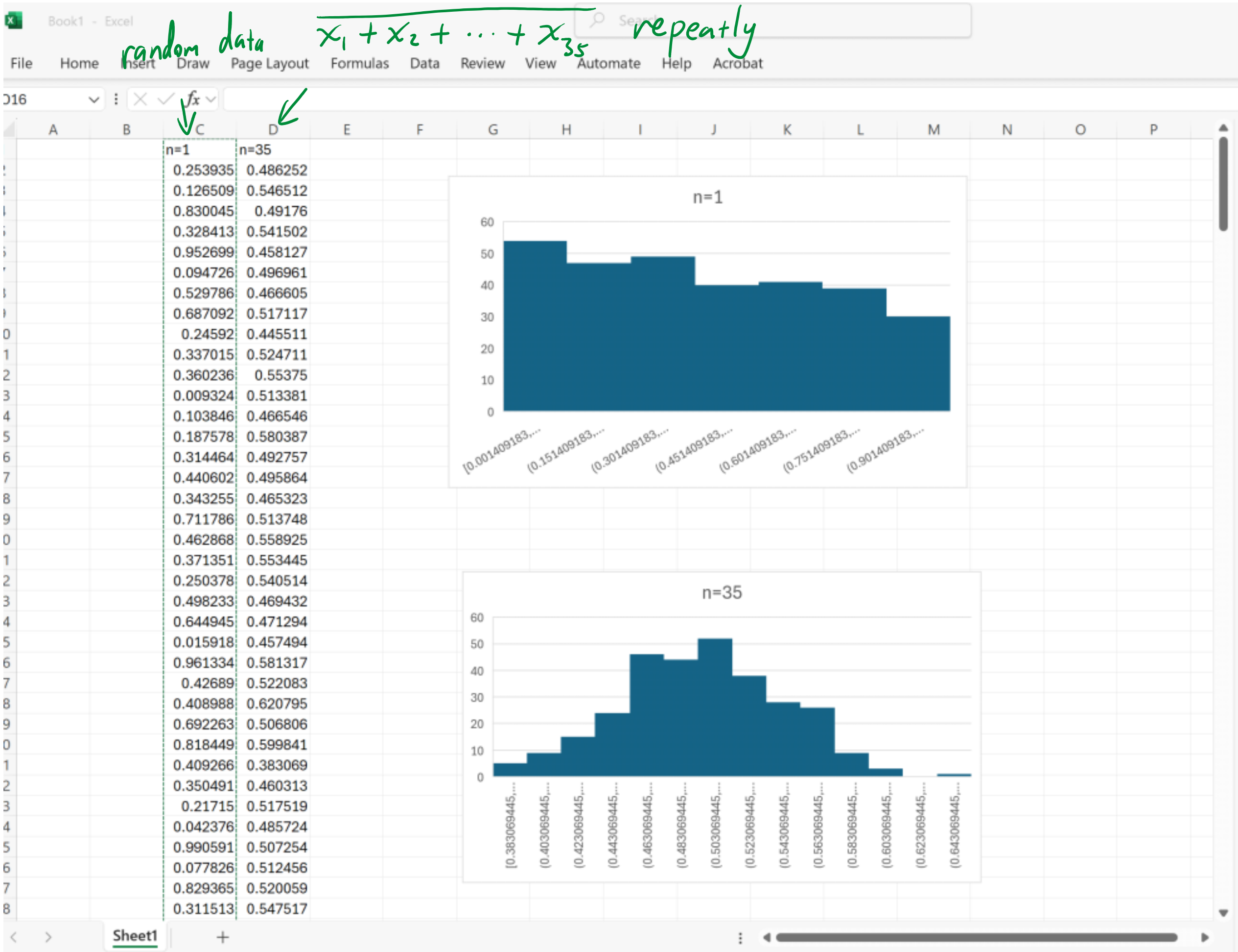
III. Cont.

random data $\overline{x_1 + x_2 + \cdots + x_{35}}$ repeatly



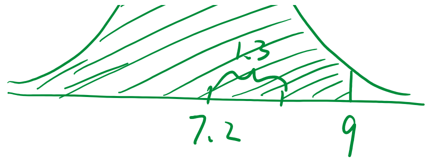
n=1	n=35
0.253935	0.486252
0.126509	0.546512
0.830045	0.49176
0.328413	0.541502
0.952699	0.458127
0.094726	0.496961
0.529786	0.466605
0.687092	0.517117
0.24592	0.445511
0.337015	0.524711
0.360236	0.55375
0.009324	0.513381
0.103846	0.466546
0.187578	0.580387
0.314464	0.492757
0.440602	0.495864
0.343255	0.465323
0.711786	0.513748
0.462868	0.558925
0.371351	0.553445
0.250378	0.540514
0.498233	0.469432
0.644945	0.471294
0.015918	0.457494
0.961334	0.581317
0.42689	0.522083
0.408988	0.620795
0.692263	0.506806
0.818449	0.599841
0.409266	0.383069
0.350491	0.460313
0.21715	0.517519
0.042376	0.485724
0.990591	0.507254
0.077826	0.512456
0.829365	0.520059
0.311513	0.547517

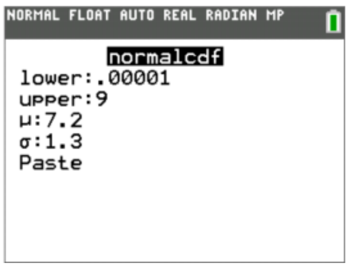
eg The birth weights of U.S. babies have a normal distribution with a mean of 7.2 pounds and standard deviation of 1.3 pounds. Find:

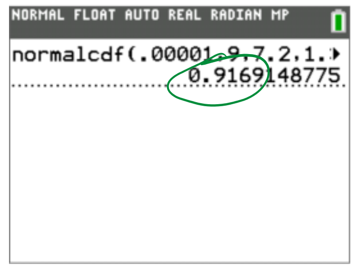
a. the probability that an individual baby chosen at random weighs less than 9 lbs.

b. the probability that a group of 5 babies chosen at random will have a mean weight between 6 lbs and 7.5 lbs.

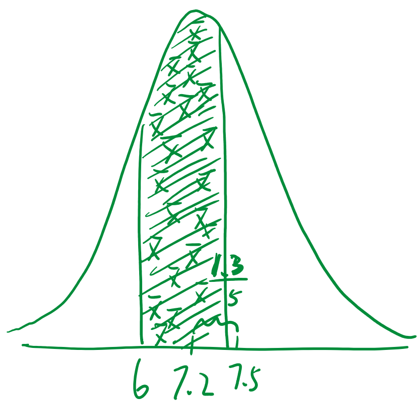
S: a. 1 baby







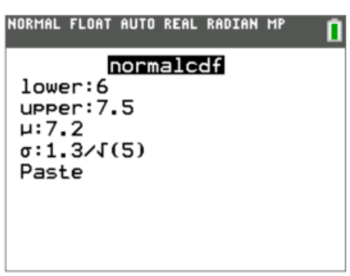
b.

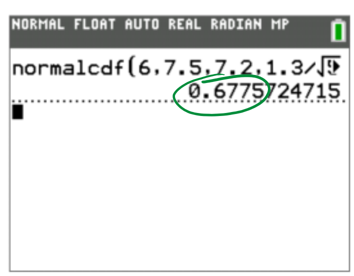


"taller" because std. dev is smaller

$\frac{1.3}{\sqrt{5}}$

"10 vs $\frac{10}{2} = 5$"





68. The percent of fat calories that a person in America consumes each day is normally distributed with a mean of about 36 and a standard deviation of about ten. Suppose that 16 individuals are randomly chosen. Let $\overline{x}$ = average percent of fat calories.

a. $\overline{x}$ ~ ______(______, ______)

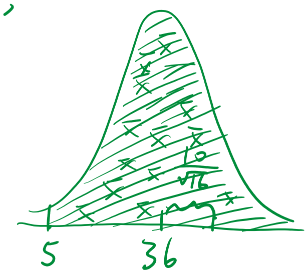
b. For the group of 16, find the probability that the average percent of fat calories consumed is more than five. Graph the situation and shade in the area to be determined.

>5

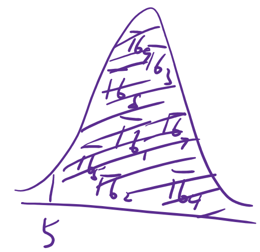
c. Find the first quartile for the average percent of fat calories.

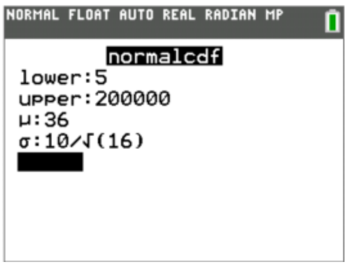
S: a. $\bar{x} \sim \boxed{N\left(36, \frac{10}{\sqrt{16}}\right)}$

b. $n = 16$,

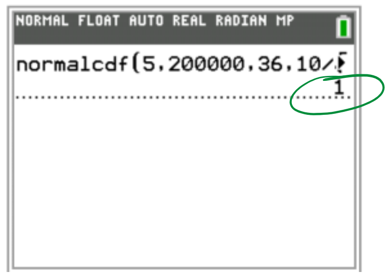


$\leftarrow$ $\bar{x}$ is $\sqrt{16}$ $\leftarrow$ or

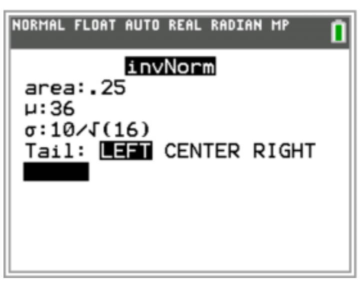




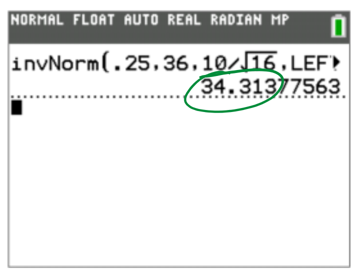
$\rightarrow$



c. It asked for P_{25}'s data.



$\rightarrow$



calories

69. The distribution of income in some developing countries is considered wedge shaped (many low income people, very few middle income people, and even fewer high income people). Suppose we pick a country with a wedge shaped distribution. Let the average salary be $2,000 per year with a standard deviation of $8,000. We randomly survey 1,000 residents of that country.

a. In words, X = _____________
b. In words, $\overline{X}$ = _____________
c. $\overline{X}$ ~ _____(_____,_____)
d. How is it possible for the standard deviation to be greater than the average?
e. Why is it more likely that the average of the 1,000 residents will be from $2,000 to $2,100 than from $2,100 to $2,200?

S: a. X = yearly income of a person in a third world country.

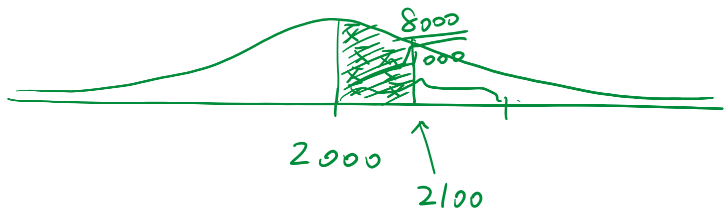
b. $\bar{X}$ = average salary from samples of 1000 residents of a third world

b. $\bar{x}$ = average salary from samples of 1000 residents of a third world country

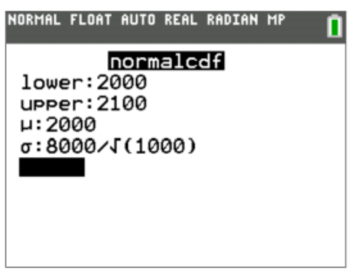
c. $\bar{x} \sim \boxed{N\left(2000, \frac{8000}{\sqrt{1000}}\right)}$

d. The sample mean's probabilities is really close to the population mean's probability. The bell-curve is very short.

e. $P(2000 \le \bar{x} \le 2100)$



$P(2000 \le \bar{x} \le 2100)$:



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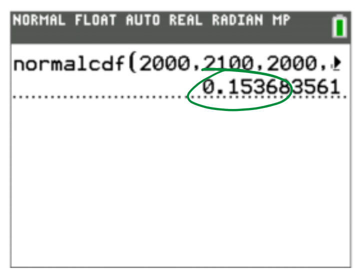
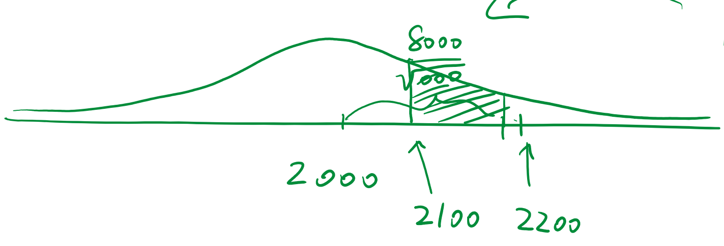
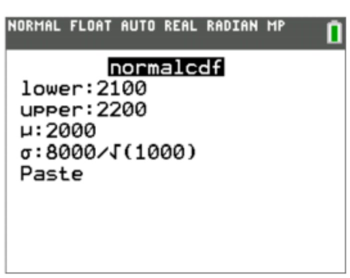


$P(2100 \le \bar{x} \le 2200)$



$P(2100 \le \bar{x} \le 2200)$:



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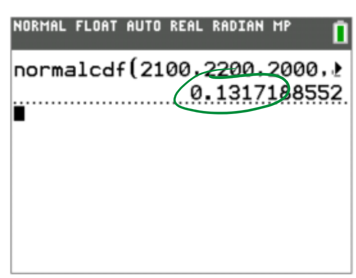

Thus, $P(2000 \leq \bar{x} \leq 2100)$ has more probability.