Questions at the end of Ch 8.1 (Consider an event unusual if it has less than a 5% probability of occuring):

16)

A. x̄ is normally distributed, even though the population may not be normally distributed.

B. sigma sub x bar = 18/sqrt(36)

P(x bar < 62.6) = 0.32036

Input interpretation

$\mathbb{P}(x < 62.6)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 64$ |
| standard deviation | $\sigma = 3$ |

Result

$$\frac{2\,885\,629\,137\,527\,899}{9\,007\,199\,254\,740\,992} \approx 0.320369$$

C.

P(x bar >= 68.7) = 0.05859

Input interpretation

$\mathbb{P}(x \geq 68.7)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 64$ |
| standard deviation | $\sigma = 3$ |

Result

$$\frac{4\,222\,309\,337\,190\,653}{72\,057\,594\,037\,927\,936} \approx 0.0585963$$

D.

P(59.8 < x bar < 65.9) = 0.65598

Input interpretation

$\mathbb{P}(59.8 < x < 65.9)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 64$ |
| standard deviation | $\sigma = 3$ |

$\mathbb{P}($

Result

$$\frac{5\,908\,590\,717\,151\,007}{9\,007\,199\,254\,740\,992} \approx 0.655985$$

20)

A. P(x<40) = 0.18917

Input interpretation

$\mathbb{P}(x < 40)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 43.7$ |
| standard deviation | $\sigma = 4.2$ |

Result

$$\frac{3407816141479169}{18014398509481984} \approx 0.189172$$

Enlarge

B. sigma sub x bar = 4.2/sqrt(9)

P(x bar < 40) for n=9 = 0.00411

Input interpretation

$\mathbb{P}(x < 40)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 43.7$ |
| standard deviation | $\sigma = 1.4$ |

Result

$$\frac{592383414023623}{144115188075855872} \approx 0.00411049$$

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C. P(x bar < 40) for n=12 = 0.00113

Input interpretation

$\mathbb{P}(x < 40)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 43.7$ |
| standard deviation | $\sigma = 1.21244$ |

Result

$$\frac{5246782218862559}{4611686018427387904} \approx 0.00113771$$

Enlarge

D. Larger sample sizes create smaller and smaller standard errors. Values farther from the sampling distribution's mean (which is equal to the population mean) become less and less likely.

E. Yes, it's unusual because the probability of the sampling distribution having a mean equal to or greater than 46 is only just above 1%.

Input interpretation

$\mathbb{P}(x > 46)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 43.7$ |
| standard deviation | $\sigma = 1.08444$ |

Result

Enlarge

$$\frac{2444811948283511}{144115188075855872} \approx 0.0169643$$

26)

A. Without replacement, the sample size should be less than 5% of the population

B. sigma sub x bar = 13.1/sqrt(40), P(x <56.8) = 0.11372

Input interpretation

$\mathbb{P}(x < 56.8)$ where

$x \approx$ normal distribution

| | |
|---|---|
| mean | $\mu = 59.3$ |
| standard deviation | $\sigma = 2.07129$ |

$\mathbb{P}(A)$ is the probability of the event $A$

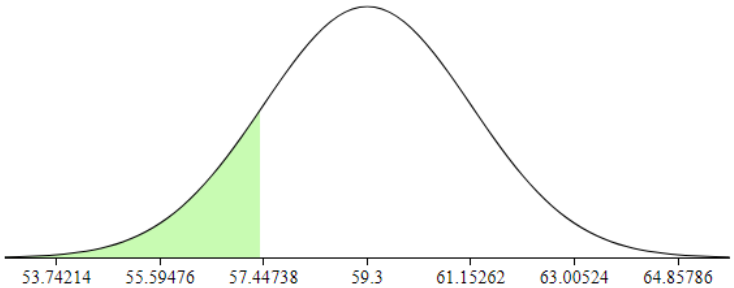
Result

More digits

$$\frac{8194436699511495}{72057594037927936} \approx 0.113721$$

C.

Mean = 59.3 SD = 1.85262 Plot distribution




Calculate boundary value(s) for a left-tail area of 0.15

Show labels on plot

Calculate value(s) Value = 57.3798828 (z = -1.0364334)

…At or below 57.37988 seconds

39)

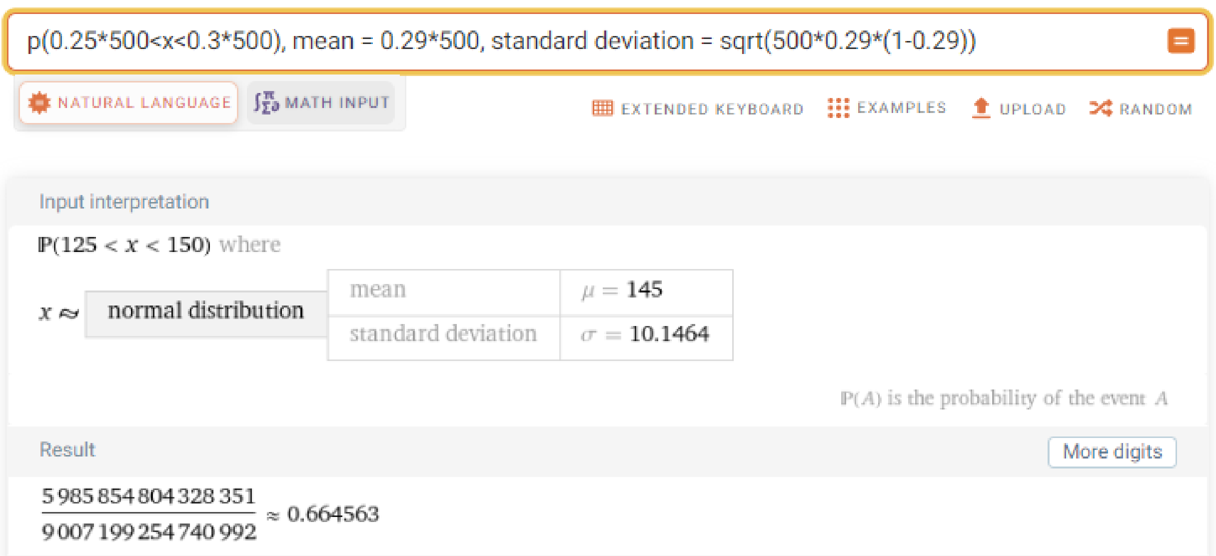
B. Larger. Distribution of sample means will be centered more around the mean for larger samples because of a smaller standard error.
A.Smaller. Distribution of sample means will have a larger standard error which means more variance and a larger proportion of the distribution lying farther away from the mean.

Questions at the end of Ch 8.2:

18)
A. Approximately normal

B. standard deviation = sqrt(500*0.29*(1-0.29)), P(x>.30*500) = 0.31108


C.




P(0.25<x<0.3) = 0.66456

D.

p(x<125), mean = 0.29*500, standard deviation = sqrt(500*0.29*(1-0.29))

NATURAL LANGUAGE MATH INPUT EXTENDED KEYBOARD EXAMPLES UPLOAD RANDOM

Input interpretation

$\mathbb{P}(x < 125)$ where

$x \approx$ normal distribution

| | | |
|---|---|---|
| mean | $\mu = 145$ |
| standard deviation | $\sigma = 10.1464$ |

$\mathbb{P}(A)$ is the probability of the event $A$

Result

More digits

$$\frac{7019591745879655}{288230376151711744} \approx 0.0243541$$

Plot

P(x<125) = 0.02435