19-15

a) varies ex: 29, 26, 2, 11, 8, 18, 0, 5, 40, 3

b) $\bar{x} = 14.2$
$s_x = 13.53$
$n = 10$

$14.2 \pm 1.833 \left(\frac{13.54}{\sqrt{10}}\right)$ (t^*_9)

$(6.36, 22.04)$

c) NO! $n = 10$ ($10 < 30$) and pop. IS skewed right

d) varies (yes)

e) not really → fails conditions

f) Yes $n = 40 \geq 30$ → more likely to 'succeed'

19-17

a) o.u. → adult Amer.
var. → # of people...
Quant.

b) $n = 1467 \geq 30$
Samp. dist. is approx. normal when $n \geq 30$, even if pop. is not

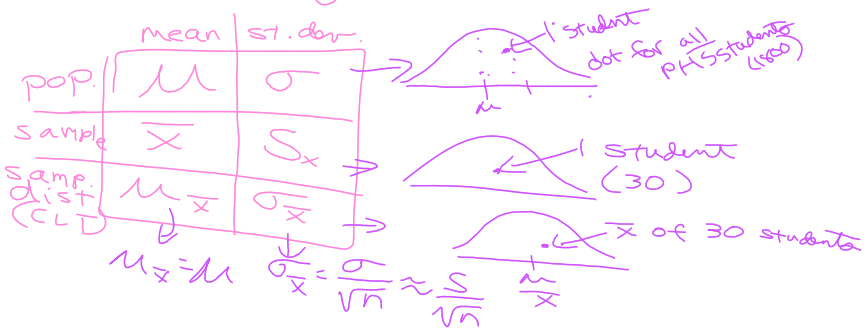
c) $1.987 \pm t^*_{1466}\left(\frac{1.7708}{\sqrt{1467}}\right)$
$(1.911, 2.0631)$

d)
- ✓ Good – interpret
- ✗ doesn't est. individual answers ⇒ est. avg of all ind.
- ✗ doesn't est. sample means. est. pop mean
- ✗ same
- ✓ Good → long version
- ✗ doesn't est. ind. values

e)

f)
- ↑ n → narrower int.
- ↑ $\bar{x}$ → whole int. moves up/width stays same
- ↓ s_x → narrower int
- ↑ $\bar{x}$ by 1 → whole interval moves up 1/width stays same

20 Sign. Tests – means



1) define param/hypoth.

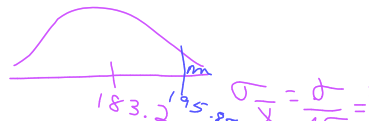
μ = the mean # pts. scored/game in all NBA games

$H_0: \mu = 183.2$ (scoring stayed same)

$H_a: \mu > 183.2$ (scoring inc. rule changes worked)

2) CLT/cond:

sample:
$n = 25$
$\bar{x} = 195.88$
$s_x = 20.272$



$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{20.272}{\sqrt{25}} = 4.054$

$t = \frac{195.88 - 183.2}{\frac{20.272}{\sqrt{25}}}$

$t = 3.13$

- $n \geq 30$ or pop. is normal
  $n = 25 \not\geq 30$
  - (draw dotplot of sample) because sample graph is fairly symm/mound ⇒
  - Safe to assume the pop. is normal.
- SRS from pop. of int.
  not a random sample of all NBA games but safe to treat as SRS.

$P(t > 3.13) =$ between .001 & .0025

$.001 < p\text{-value} < .0025$

With a p-value between .001 & .0025, this is Sign. @ $\alpha = .005$.
Reject H_0.

* There is evid. that the rule change worked (scoring inc.)

Sign. level:

$\alpha = .10$ yes
$\alpha = .01$ yes
$\alpha = .0025$ yes
$\alpha = .002$ → can't tell
$\alpha = .001$ no