Homework 7 MATH 1550 Fall 2019

§5.4 #20 $\mu = 136$, $\sigma = 5.12$, $n = 12$

$$\mu_{\bar{x}} = \mu = 136$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{5.12}{\sqrt{12}} = 1.4780$$

#28 $\mu = 65700$ $n = 48$, $\sigma = 14500$

$$\mu_{\bar{x}} = \mu = 65700$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{14500}{\sqrt{48}} = 2092.8947$$

$$P(\bar{x} < 63400) = P\left(\frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}} < \frac{63400 - 65700}{2092.8947}\right)$$

$$= P(z < -1.09)$$

$$= 0.1379$$

§6.1 #37 $n = 50$, $\bar{x} = 2650$ $\sigma = 425$ 95% conf.

$\downarrow$

$z_c = 1.96$

Soln: $E = z_c \frac{\sigma}{\sqrt{n}} = (1.96)\left(\frac{425}{\sqrt{50}}\right) = 117.804$

So, with 95% certainty,

$$2650 - 117.804 < \mu < 2650 + 117.804$$

$$2352.196 < \mu < 2767.804$$

§6.2

#20 $n = 7$, $\bar{x} = 110$, $s = 44.50$ want: 95% conf

$n = 7 \rightarrow$ d.f. $= 6$

95% conf and d.f. $= 6$ $\rightarrow$ $\boxed{\pm t_c = 2.447}$ $\leftarrow$ t-dist table

Soln:

Here,

$$E = t_c \frac{s}{\sqrt{n}} = (2.447)\left(\frac{44.5}{\sqrt{7}}\right)$$

$$= 41.1571$$

Therefore with 95% confidence, we can say

$$110 - 41.1571 < \mu < 110 + 41.1571$$

$$68.8429 < \mu < 151.1571$$