Homework #10

Ben Drucker

6.2

8

a)

$P\left[z_{\alpha_1} \leq (\overline{X} - \mu)\frac{\sigma}{\sqrt{n}} \leq z_{\alpha_2}\right] = 1 - \alpha$. Solving for $\mu : \overline{X} - z_{\alpha_2}\frac{\sigma}{\sqrt{n}} \leq \mu \leq \overline{X} + z_{\alpha_1}\frac{\sigma}{\sqrt{n}}$.
$\left(\overline{X} - z_{\alpha_2}\frac{\sigma}{\sqrt{n}}, \overline{X} + z_{\alpha_1}\frac{\sigma}{\sqrt{n}}\right)$

b)

$z_{\alpha_1} = 2.24; z_{\alpha_2} = 1.78$. So the width is: $(2.24 + 1.78)\frac{\sigma}{\sqrt{n}} = 4.02\frac{\sigma}{\sqrt{n}}$. This is wider than the $3.96\frac{\sigma}{\sqrt{n}}$ width of the 7.5 interval.

7.2

12

$.81 \pm 2.58\frac{.34}{\sqrt{110}} = (.73, .89)$

14

a)

$89.1 \pm 1.96\frac{3.73}{\sqrt{169}} = (88.54, 89.66)$. This interval appears very precise.

b)

$n = \left(\frac{1.96 * .16}{.5}\right)^2 = 245.9; n = 246$.

18

$\overline{x} - z_{1-.9}\frac{s}{\sqrt{n}} = 4.25 - 1.28\frac{1.3}{\sqrt{75}} = 4.059$

20

$.15 \pm 2.58\sqrt{\frac{.15 * .85}{4722}} = (.137, .163)$

7.3

28

Via a t table:

a

1.341

b

1.753

c

1.708

d

1.684

e

2.704

30

Via a t table:

a

$t_{.025,10} = 2.228$

b

$t_{.025,15} = 2.131$

c

$t_{.005,15} = 2.947$

d

$t_{.005,4} = 4.604$

e

$t_{.01,24} = 2.492$

e

$t_{.005,37} = 2.712$