8.15 $90\% \rightarrow \alpha = 0,1$

$\overline{x} = 23,167$; $n = 5$; $s = 9,53$.

$t_{\frac{\alpha}{2};n-1} = t_{0,05;4} = 2,132$.

$\varepsilon = 2,132 \cdot \frac{9,53}{\sqrt{5}} \simeq 9,09$.

KTC : $\overline{x} - \varepsilon \leq \mu \leq \overline{x} + \varepsilon$

$\Rightarrow 14,07 \leq \mu \leq 32,257$

8.16 $n = 10$ $\overline{x} = 317,2$ KTC $= 99\%$.

$\sigma = 15,7$

KTC : $99\% \Rightarrow 100\%(1-\alpha) = 99\% \Rightarrow \alpha = 0,01$

$t_{\frac{\alpha}{2};n-1} \Rightarrow t_{5.10^{-3};9} = 3,25$.

$\varepsilon = 3,25 \cdot \frac{15,7}{\sqrt{10}} \simeq 16,14$.

$\Rightarrow 301,06 \leq \mu \leq 333,34$

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8.17

$\overline{x} = 2,9$; $s \simeq 0,099$; $n = 12$.

KTC : 99 % $\rightarrow$ $\alpha = 0,01$.

$t_{5.10^{-3};11} = 3,106$.

$\mathcal{E} = 3,106 \cdot \frac{0,099}{\sqrt{12}} = 0,089$.

$\Rightarrow 2,813 \leq \mu \leq 2,99$

8.19

a) $\overline{x} = 156,2$; $s = 6,14$; $n = 27$

b) 95 % $\Rightarrow \alpha = 0,05$.

$t_{0,025;26} = 2,056$.

$\mathcal{E} = 2,056 \cdot \frac{6,14}{\sqrt{27}} = 2,43$.

$\Rightarrow 153,77 \leq \mu \leq 158,63$

8.20.

a) $\overline{x} = 228,8$; $s \simeq 12,9$; $n = 82$.

95 % $\Rightarrow \alpha = 0,05$.

$\Rightarrow t_{0,025;81} = 1,96$.

$\mathcal{E} = 1,96 \cdot \frac{12,9}{\sqrt{82}} = 2,79$.

$\Rightarrow 226,01 \leq \mu \leq 231,59$.

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b) 99% $\Rightarrow \alpha = 0{,}01$

$\Rightarrow t_{5.10^{-3};\,81} = 2{,}576$

$\varepsilon = 2{,}576 \cdot \frac{12{,}9}{\sqrt{82}} = 3{,}67$

$\Rightarrow 225{,}13 \le \mu \le 232{,}47$

8.21

a) $\overline{x} = 137{,}83$; $s \simeq 4{,}41$; $n = 12$

$\sigma = 4{,}22$

b) ĐTC: 95% $\Rightarrow \alpha = 0{,}05$

$z_{1-\frac{\alpha}{2}} = 1{,}9599$

$\Rightarrow \varepsilon = z_{1-\frac{\alpha}{2}} \cdot \frac{s}{\sqrt{n}}$

$\Rightarrow \sqrt{n} = z_{1-\frac{\alpha}{2}} \cdot \frac{s}{\varepsilon}$

$\Leftrightarrow n = \left(z_{1-\frac{\alpha}{2}} \cdot \frac{s}{\varepsilon}\right)^2 = \left(1{,}9599 \cdot \frac{4{,}41}{1}\right)^2$

$\Rightarrow n \simeq 74{,}7$

mà $n \in N = 75$

8.22

a) $\overline{x} \simeq 1391{,}41$ $n = 128$; $s \simeq 234{,}45$

b) KTC: 95% $\Rightarrow \alpha = 0{,}05$

$t_{0{,}025;\,127} = 1{,}96$

$\varepsilon = 1{,}96 \cdot \frac{234{,}45}{\sqrt{128}} \simeq 40{,}62$

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$\Rightarrow 1350,79 \le \mu \le 1432,03$.

b) KTC: 95% $\Rightarrow \alpha = 0,05$.

$t_{0,025;\,127} = 1,96$.

$\varepsilon = \frac{s}{\sqrt{n}} \cdot z_{1-\frac{\alpha}{2}} \Rightarrow n = \left(1,96 \cdot \frac{234,45}{30}\right)^2 = 234,6$.

mà $n \in N \Rightarrow n = 235$.

8.29

Gọi p là tỉ lệ số liệu tử được bầu cử tổng thống.

Tỷ lệ mẫu: $f = \frac{412}{768}$

$\Rightarrow s = \sqrt{nf(1-f)} = \sqrt{768 \cdot \frac{412}{768} \cdot \left(1 - \frac{412}{768}\right)} \simeq 13,82$

KTC: 95% $\Rightarrow \alpha = 0,05 \Rightarrow z_{0,095} = 1,96$.

$z_{1-\frac{\alpha}{2}}$

$\varepsilon = z_{1-\frac{\alpha}{2}} \cdot \frac{s}{n} = 1,96 \cdot \frac{13,82}{768} \simeq 0,0353$.

$\Rightarrow 0,501 \le p \le 0,571$

8.31

Gọi p là tỉ lệ khỏi bệnh nếu dùng thuốc điều trị

Tỷ lệ mẫu: $f = \frac{40}{50}$

$s = \sqrt{50 \cdot \frac{40}{50}\left(1 - \frac{40}{50}\right)} = 2\sqrt{2}$

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KTC: 95% $\Rightarrow \alpha = 0{,}05$.

$z_{1-\frac{\alpha}{2}} = z_{0{,}975} = 1{,}96$.

$\varepsilon = 0{,}11$

$\Rightarrow 0{,}69 \le p \le 0{,}91$.

KTC: 99% $\Rightarrow \alpha = 0{,}01$

$z_{0{,}995} \simeq 2{,}58$.

Tỷ lệ mẫu $f = \frac{40}{50}$.

$\varepsilon = 2{,}58 \cdot \frac{2\sqrt{2}}{50} \simeq 0{,}15$.

$\Rightarrow 0{,}65 \le p \le 0{,}95$

b) KTC: 95% $\Rightarrow \alpha = 0{,}05$

$z_{0{,}975} \simeq 1{,}96$.

$\Rightarrow \varepsilon = z_{1-\frac{\alpha}{2}} \cdot \frac{\sqrt{f(1-f)}}{\sqrt{n}}$

$\Leftrightarrow n = \left(\frac{1{,}96 \cdot \sqrt{\frac{40}{50} \cdot \left(1 - \frac{40}{50}\right)}}{0{,}02} \right)^2$

$\simeq 1536{,}64$

mà $n \in \mathbb{N} \Rightarrow n = 1537$

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8.32 $95\% \Rightarrow \alpha = 0{,}05$

$\Rightarrow z_{0{,}975} \simeq 1{,}96$.

$f = 0{,}01$.

$$\Rightarrow n = \left(1{,}96 \frac{\sqrt{0{,}01 \cdot (1-0{,}01)}}{0{,}005}\right) \simeq 1521$$

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