10.14. a) $n = 50 \quad \mu = 15 \quad \sigma = 0.5$

$\sigma_{\bar{x}} = \frac{0.5}{\sqrt{50}} = 0,071 \qquad z = \frac{14.9 - 15}{0,071} = -1,41$

$P(-1,41) = 0,0793$

b) $\mu = 14.8 \qquad z = \frac{14.9 - 14.8}{0,071} = 1,41$

$\mu = 14.9, \; z = 0 \qquad P(Z > 0) = 0,5$

10.20.

$z = \frac{5.23 - 5.5}{0.24/\sqrt{641}} = -9 \qquad P(z < -9) \approx 0$

10.21

$z = \frac{788 - 800}{40/\sqrt{30}} = -1,64 \qquad P(z < -1,64) = 0,0505 = 0.101$

10.29

$\alpha = 0.05 \quad df = 19$

$t < -1.729$

$t = \frac{33.1 - 35}{4.3/\sqrt{20}} = -1.98$ it takes less than 35 min

10.47

$n = \frac{[1.645 + 1.282]^2 (0.24)^2}{0,3^2} = 5,48$ need 6

10.48

0.98 $\beta$ 20.1 $\sigma$ 25.8 $\delta$ 35 > -40 2 -4,1

$\alpha$ 20.05 $z_{0,05}$ 21.645 $z_{0,1}$ 1,28

$$n = \frac{(1.645 + 1.28)^2 (8.8)^2}{(-4,1)^2} = 17,12 \approx 18$$

Chapter 8

№3 $\sigma = 20$

$\mu = 50$

$n = 64$

a) $\bar{x} = 52,5$ $\frac{52.5-50}{\frac{20}{\sqrt{64}}} = 1$ 0,3174

b) $\bar{x} = 55$ $\frac{55-50}{2.5} = 2$ 0,0456

c) $\bar{x} = 57.5$ $\frac{57.5-50}{2.5} = 3$ 0.0026

№4 $\mu_0 = 8,2$ $n = 10$

$\mu = 8.179$

$\sigma = \sqrt{\frac{1}{9}((8,18 - 8,179)^2 + \dots}$ = 0,0226

$t = \frac{8.179 - 8.2}{0,0226/\sqrt{10}} = -2,94 < -2,262$

$p = 0,008$

N7 $\frac{8,31-8,2}{0,02/\sqrt{6}} = 13,41$

$\delta = 1,32 - 8,2 = 0,12$

$z = \frac{0,12}{0,02/\sqrt{6}} = \frac{0,12}{0,0082} = 14,63$

N10

$z = \frac{7,2-7,6}{1,2/\sqrt{10}} = \frac{-0,4}{0,3} = -1,321$

a) $z_\alpha = -1,645$ $0,05$

$-1,3333 > -1,645$

b) $z_\alpha = -2,33$

$-1,3333 > -2,33$

c) $p(z < -1,3333) \approx 0,0918$

N11 $n = 20$

$\bar{x} = 105$

$\mu_0 = 100$

a) $z = \frac{105-100}{5/\sqrt{20}} = 4,472$

b) $P(z > 4,472) \approx 0$

b) $\frac{105-100}{10/\sqrt{20}} \approx 2,236$

$P(Z > 2,236) \approx 0,0127$

c) $\frac{105-100}{15/\sqrt{20}} \approx 1,49$

$P(Z > 1,49) \approx 0,0681$

№21 $H_0 = 30$

$n = 10$

$\bar{x} = 26.4$

$s = 3.5$

$t = \frac{26.4-30}{3.5/\sqrt{10}} \approx -3,25$

$t_{кр} = 1,833$

$t = -3.25 < -1,833$ reject