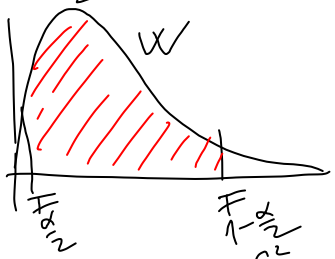
$$P\left(F_{\frac{\alpha}{2}}(m_1-1, m_2-1) \le W \le F_{1-\frac{\alpha}{2}}(m_1-1, m_2-1)\right) \ge 0{,}95$$



$$P\left(F_{\frac{\alpha}{2}}(m_1-1, m_2-1) \le \frac{\frac{\sigma_1^2}{S_1^2}}{\frac{\sigma_2^2}{S_2^2}} \le F_{1-\frac{\alpha}{2}}(m_1-1, m_2-1)\right)$$

$$P\left(\frac{F_{\frac{\alpha}{2}}(\,,\,)}{\frac{S_1^2}{S_2^2}} \le \frac{\frac{1}{\sigma_1^2}}{\frac{\sigma_2^2}{S_2^2}} \le \frac{F_{1-\frac{\alpha}{2}}(\,,\,)}{\frac{S_1^2}{S_2^2}}\right)$$

$$P\left(\frac{\frac{S_1^2}{S_2^2}}{F_{1-\frac{\alpha}{2}}(\,,\,)} \le \frac{\sigma_1^2}{\sigma_2^2} \le \frac{\frac{S_1^2}{S_2^2}}{F_{\frac{\alpha}{2}}(\,,\,)}\right)$$

D H

$$\frac{\sigma_1^2}{\sigma_2^2} \le \frac{\frac{S_1^2}{S_2^2}}{F_\alpha(m_1-1, m_2-1)}$$

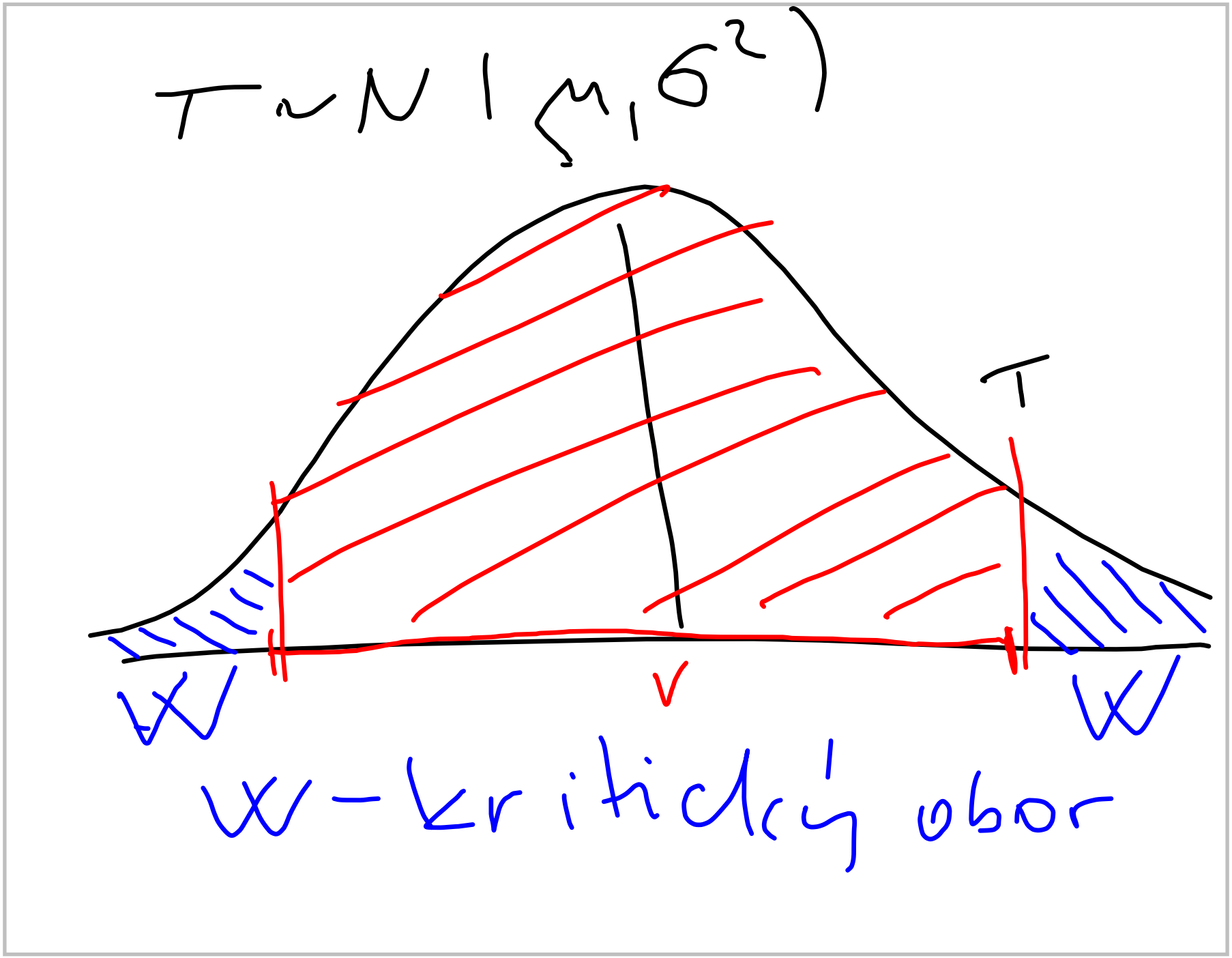
$S_1^2 = \frac{1}{3}\cdot 10^{-4}$ $S_2^2 = 8\cdot 10^{-4}$

$$\frac{\sigma_1^2}{\sigma_2^2} \le \frac{\frac{\frac{1}{3}\cdot 10^{-4}}{8\cdot 10^{-4}}}{F_{0{,}05}(3,3)} = \frac{\frac{1}{24}}{0{,}108} = 9{,}3865$$

$F_{0{,}95}(3,3) = 9{,}2766$

$F_{0{,}05}(k_1,k_2) = \frac{1}{F_{0{,}95}(k_2,k_1)} = 0{,}108$

$$\frac{\sigma_1}{\sigma_2} \le \sqrt{9{,}3865} = 0{,}6217$$


$T \sim N(\mu, \sigma^2)$
T
V
W
W
W - kritický obor

$\mu_0 = 253\,g \quad n = 50$

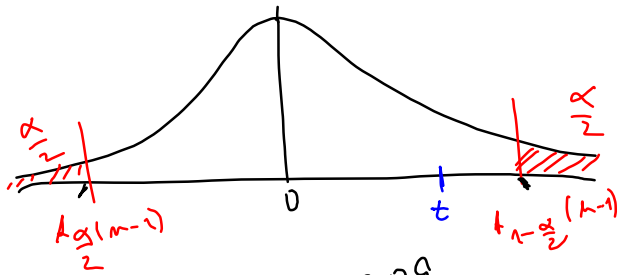
$m = 262{,}5\,g \quad s = 65\,g$

$\alpha = 0{,}05$

$$T = \frac{M - \mu}{\frac{S}{\sqrt{n}}} \sim t(n-1)$$

t-test

$H_0: m = \mu_0 \quad \times \quad H_1: m \neq \mu_0$



$t_{0{,}025}(49) = -2{,}009$

$t_{0{,}975}(49) = 2{,}009$

$W = (-\infty; -2{,}009) \cup (2{,}009; \infty)$

$$A = \frac{262{,}5 - 250}{\frac{65}{\sqrt{50}}} = 1{,}36$$

$A \notin W \Rightarrow$ hlo nezamítáme

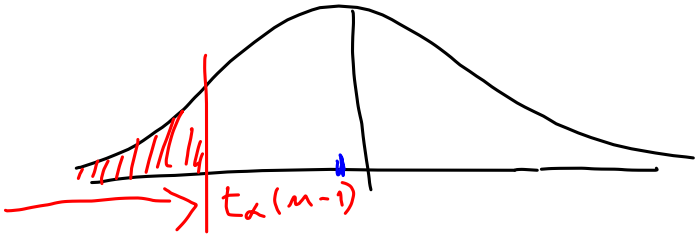
$\alpha = 0{,}01 \quad \mu_0 = 150$

$m = 149{,}25$

$s^2 = 14{,}53^2$

$$T = \frac{m - \mu}{\frac{s}{\sqrt{n}}} \sim t(n-1)$$

$H_0: m \geq 150 \quad \not\geq \quad H_1: m < 150$



$t_{0{,}01}(19) = 2{,}539$

$W = (-\infty; -2{,}539)$

$$t = \frac{149{,}25 - 150}{\frac{14{,}53}{\sqrt{20}}} = -0{,}2308$$

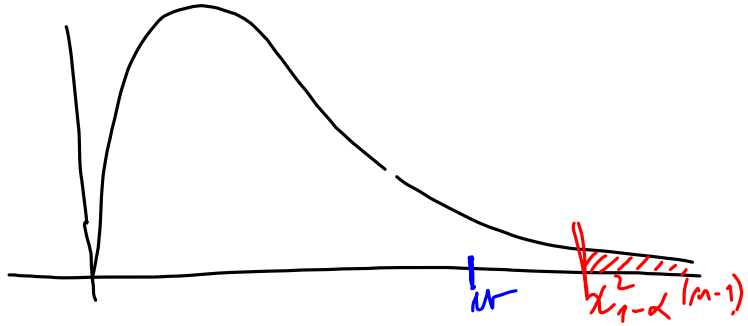
$t \notin W \Rightarrow H_0$ nezamítáme

$\mu = 160\,g \qquad \sigma_0 = 5\% = 8\,g$

$n = 20 \qquad s = 8{,}5\,g \qquad \alpha = 0{,}01$

$$W = \frac{(n-1)\cdot S^2}{\sigma^2} \sim \chi^2(n-1)$$

$H_0: \sigma \le \sigma_0 \quad \not\times \quad H_1: \sigma > \sigma_0$



$\chi^2_{0,99}(19) = 36{,}191$

$W = (36{,}191\,;\,\infty)$

$$w = \frac{19\cdot 8{,}5^2}{8^2} = 21{,}5$$

$w \notin W \Rightarrow H_0$ nezamítáme

Z	V
$n_Z = 7$	$n_V = 19$
$m_Z = 17{,}5\%$	$m_V = 15{,}3\%$
$s_Z = 3{,}2\%$	$s_V = 2{,}9\%$

$\alpha = 0{,}05$

$H_0: \mu_Z - \mu_V = 0$ (= μ_0) $\times$ $H_1: \mu_Z - \mu_V \neq 0$

$\mu_Z - \mu_V$

$$T = \frac{(m_Z - m_V) - 0}{S\sqrt{\frac{1}{n_Z} + \frac{1}{n_V}}} \sim t(n_Z + n_V - 2)$$

$H_0: \frac{\sigma_Z^2}{\sigma_V^2} = 1 \times H_1: \frac{\sigma_Z^2}{\sigma_V^2} \neq 1$

F-test

$$F = \frac{\frac{s_1^2}{\sigma_1^2}}{\frac{s_2^2}{\sigma_2^2}} \sim F(n_1 - 1, n_2 - 1)$$

$\alpha = 0{,}05$

$F_{0,975}(6,10) = 4{,}072$

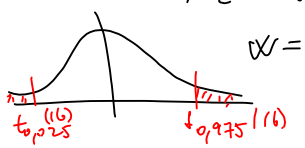
$F_{0,025}(6,10) = \frac{1}{F_{0,975}(10,6)} = \frac{1}{5{,}44} = 0{,}1818$

$W = (0; 0{,}1818) \cup (4{,}072; \infty)$

$f = \frac{3{,}2^2}{2{,}9^2} = 1{,}21 \notin W$

$$T = \frac{(m_Z - m_V) - 0}{S\sqrt{\frac{1}{n_Z} + \frac{1}{n_V}}} \sim t(n_Z + n_V - 2)$$

$$S^2 = \frac{(n_Z - 1)S_Z^2 + (n_V - 1)S_V^2}{n_Z + n_V - 2}$$

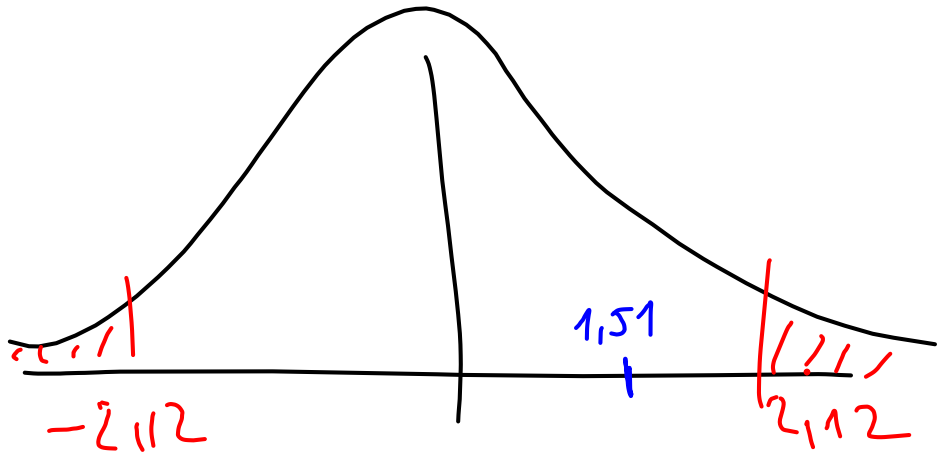


$W = (-\infty; -2{,}12) \cup (2{,}12; \infty)$

$$s^2 = \frac{(n_z - 1)\, s_z^2 + (n_v - 1)\, s_v^2}{n_z + n_v - 2}$$

$$s^2 = \frac{6 \cdot 3{,}2^2 + 10 \cdot 2{,}9^2}{16} = 9{,}096$$

$$t = \frac{17{,}5 - 15{,}3}{\sqrt{9{,}096} \cdot \sqrt{\frac{1}{7} + \frac{1}{11}}} = 1{,}51$$



$A \notin W \Rightarrow$ H_0 nezamítáme

$m_A = 6\,5$ $\quad m_B = 65{,}16$

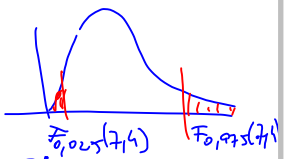
$s_A^2 = 71{,}9$ $\quad s_B^2 = 404{,}17$

$n_A = 8$ $\quad n_B = 5$

$H_0: \frac{\sigma_A^2}{\sigma_B^2} = 1 \quad \not\propto \quad H_1: \frac{\sigma_A^2}{\sigma_B^2} \neq 1$

$$F = \frac{\frac{S_A^2}{S_B^2}}{\frac{\sigma_A^2}{\sigma_B^2}} \sim F(n_A - 1, n_B - 1)$$

$\alpha = 0{,}05$



$F_{0,975}(7,4) = 9{,}074$

$F_{0,025}(7,4) = \frac{1}{F_{0,975}(4,7)} = \frac{1}{5{,}523} = 0{,}1811$

$W = (0; 0{,}1811) \cup (9{,}074; \infty)$

$t = \frac{71{,}9}{404{,}17} = 0{,}178$

$t \in W \Rightarrow H_0$ zamítáme

$$T = \frac{(\bar{x}_A - \bar{x}_B) - (\mu_A - \mu_B)}{\sqrt{\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}}}$$

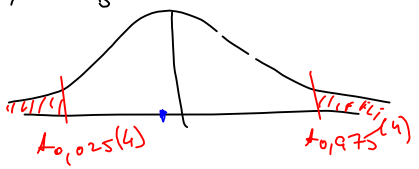
$T \sim t(m^*)$

$$m^* = \left[\frac{\left(\frac{s_A^2}{n_A} + \frac{s_B^2}{n_B}\right)^2}{\left(\frac{s_A^2}{n_A}\right)^2 \cdot \frac{1}{n_A - 1} + \left(\frac{s_B^2}{n_B}\right)^2 \cdot \frac{1}{n_B - 1}} \right] =$$

$= [4{,}9] = 4$

$$T = \frac{(\mu_A - \mu_B) - 0}{\sqrt{\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}}} \sim t(4)$$

$H_0: \mu_A - \mu_B = 0 \quad \not\subset \quad H_1: \mu_A - \mu_B \neq 0$

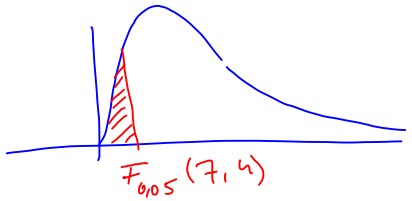


$W = (-\infty; -2,776) \cup (2,776; \infty)$

$$A = \frac{65 - 65,6}{\sqrt{\frac{71,9}{8} + \frac{404,17}{5}}} = -0,0633$$

$A \notin W \Rightarrow H_0$ nezamítáme

$H_0: \frac{\sigma_A^2}{\sigma_B^2} = 1 \quad \not\subset \quad H_1: \frac{\sigma_A^2}{\sigma_B^2} \leq 1$



$W = (0; ?)$

$A = \frac{s_A^2}{s_B^2} = 0,178$

$A \in W \Rightarrow H_0$ zamítáme

$\Rightarrow$ Na základě rozptylů