3. (1)

$W = \{ |\bar{x}| = |\frac{\bar{x}}{\sigma/\sqrt{n}}| \geq Z_{0.025} = 1.963$

$\beta = \Phi(\frac{c-\mu}{\sigma/\sqrt{n}})$, $c = 1.96 \times \frac{1}{4} + 1 = 1.49$

$\hat{\beta} = 0.0207$

4.

(1) $\mu_0 = 900$, $\mu_1 \neq 900$

$\therefore T = \frac{\bar{x} - \mu_0}{S/\sqrt{n}}$, $W = \{ |T| \geq t_{0.025}(7) \}$

$\therefore |t_0| = 1.1254 < 2.3646 = t_{0.025}(7)$

(2)

$\left(\bar{x} - \frac{S}{\sqrt{n}} t_{\frac{\alpha}{2}}(n-1), \quad \bar{x} + \frac{S}{\sqrt{n}} t_{\frac{\alpha}{2}}(n-1) \right)$

$(\quad 890.7 \quad , \quad 903.3)$

(3) $P = 2P\{ t_{(n-1)} \geq |t_0| = 1.1254 \} = 0.2975$

5. $\mu_0 \leq 167.1 \qquad \mu_1 > 167.1$

$T = \frac{\bar{x} - \mu_0}{S/\sqrt{n}}$, $W = \{ |T| \geq t_{0.025}(399) \}$

$|t_0| = |\frac{169.7 - 167.1}{4.2/20}| = 12.38 > t_{0.05}(399)$

$\therefore$ 是.

6. $\mu_0 = 0$ $\mu_1 > 0$

$T = \dfrac{\bar{X} - \mu_0}{S/\sqrt{n}}$, $W = \{ |T| \geqslant t_{0.05}(9) \}$

$\bar{X} = 3,$ $S^2 = 8.89$

$t_0 = 3.182 > t_{0.05}(9) = 1.8331$