

c)

השערה חד צדדית שמאלית: $H_1: \mu_1 < \mu_0$

נניח

$$1 - \beta = P(R/H_1) = P(Z_{\bar{x}} < -Z_{1-\alpha}/H_1) = P\left(\frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}} < -Z_{1-\alpha}/H_1\right) = P\left(\bar{x} < \mu_0 + Z_{1-\alpha} \times \frac{\sigma}{\sqrt{n}}/H_1\right)$$

$$= P\left(\frac{\bar{x} - \mu_1}{\sigma/\sqrt{n}} < \frac{(\mu_0 - Z_{1-\alpha} \times \sigma/\sqrt{n}) - \mu_1}{\sigma/\sqrt{n}}\right) = P\left(Z_{\bar{x}} < \frac{\mu_0 - Z_{1-\alpha} \times \sigma/\sqrt{n} - \mu_1}{\sigma/\sqrt{n}}\right)$$

$$\beta = P(\bar{R}/H_1) = 1 - P\left(Z_{\bar{x}} < \frac{\mu_0 - Z_{1-\alpha} \times \sigma/\sqrt{n} - \mu_1}{\sigma/\sqrt{n}}\right)$$

$$\bar{x} = \mu_1 = 9.9$$

$$1 - \beta$$

$$P\left(Z_{\bar{x}} < \frac{\mu_0 - Z_{1-\alpha} \times \sigma/\sqrt{n} - \mu_1}{\sigma/\sqrt{n}}\right) = P\left(Z_{\bar{x}} < \frac{10 - 1.645 \cdot \frac{0.3}{\sqrt{400}} - 9.9}{\frac{0.3}{\sqrt{400}}}\right) = 1$$

5.021 (הסתברות של 1)

$$\beta = 1 - (1 - \beta) = 1 - 1 = 0$$