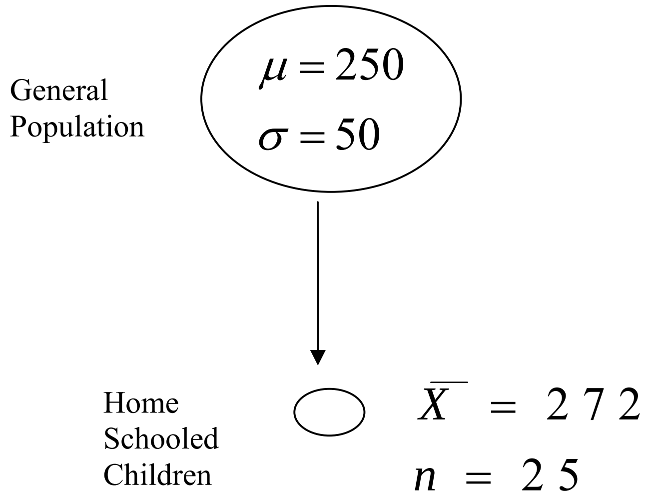
One-Sample z Test
Dr. Meyer's Problem



Step 1

$$H_0 : \mu = 250$$
$$H_1 : \mu \neq 250$$
$$\alpha = .05$$

Step 2

$$\bar{X} = 272$$
$$n = 25$$
$$\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}} = \frac{50}{\sqrt{25}} = 10$$
$$z_{calc} = \frac{\bar{X} - \mu}{\sigma_{\bar{X}}} = \frac{272 - 250}{10} = 2.2$$

Step 3

1. Critical Value (CV) Approach

$z_{crit} = z_{\alpha} = z_{.05} = 1.96$

$z_{calc} \geq z_{crit}$

Reject H_0

2. The p value Approach

$p = .039 \times 2 = .0278$

$p \leq \alpha$

Reject H_0

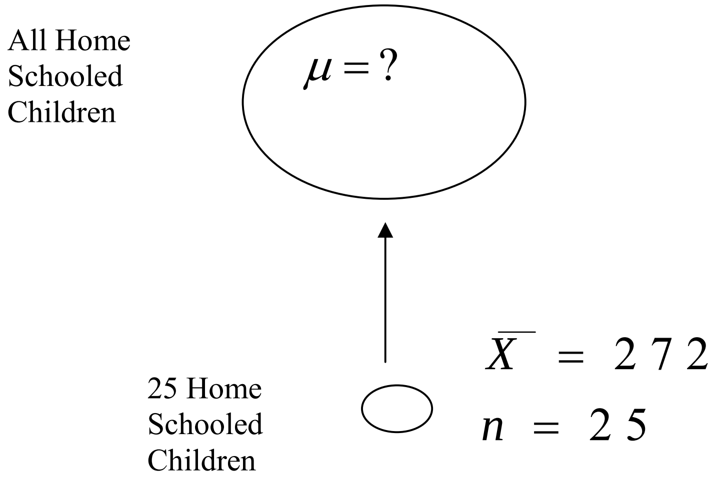
Step 4

Reject H_0

The mean for the home-schooled group is significantly higher than that of the state value ($z = 2.2, p = .0278$).

Note:($z = 2.2, p < .05$)

Interval Estimation



Point Estimate ± (Critical Value at α)(SE)

$$\bar{X} \pm Z_{\alpha} \cdot \sigma_{\bar{X}}$$

A 95% (α = .05) Confidence Interval

$$272 \pm (1.96) \cdot (10) = 272 \pm 19.6$$

$$252.4 < \mu < 291.6$$

A 99% (α = .01) Confidence Interval

$$272 \pm (2.58) \cdot (10) = 272 \pm 25.8$$

$$246.2 < \mu < 297.8$$