① $M = 100$ $\sigma = 15$ $n = 36$ $\bar{x} = 109$
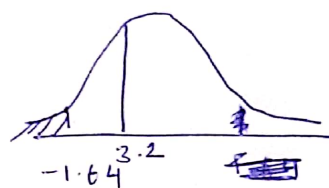
$H_0 : M \geq 100$

$H_1 : M < 100$

$$Z_{test} = \frac{\bar{x} - M}{SE} \qquad SE = \frac{\sigma}{\sqrt{n}} = \frac{15}{\sqrt{36}} = 2.5$$

$$= \frac{109 - 100}{2.5} = 3.2 \; //$$

$Z_{critical} = -1.64$
0.05

Since Z_{test} is within the acceptance region

⟹ Accept H_0 (Failed to reject H_0)

⟹ Raw cornstarch diet have no positive effect on blood glucose levels. //

② $\hat{P_1} = 0.52$ $n_1 = 100$

$\hat{P_2} = 0.47$ $n_2 = 100$

$$\sigma_d = \sqrt{\frac{\hat{P_1}(1-\hat{P_1})}{n_1} + \frac{\hat{P_2}(1-\hat{P_2})}{n_2}} = \sqrt{\frac{(0.52)(1-0.52)}{100} + \frac{0.47(1-0.47)}{100}}$$

$$= 0.0706$$

$M_{\hat{P_1} - \hat{P_2}} = 0.52 - 0.47 = 0.05$

$$Z_{score} = \frac{x - M_{\hat{P_1} - \hat{P_2}}}{\sigma_d}$$

Since $x - M_{\hat{P_1} - \hat{P_2}}$ should be less than zero for greater percentage of Republican voters in the second state than in the first state. ⟹ $x = 0$

$Z_{score} = \frac{0 - 0.05}{0.0706} = -0.708$

$Z_{-0.708} = 0.24.146 = 24.146 \, \%$
①

③

$M = 1026$

$\sigma = 209$ $X = 1100$

$Z = \dfrac{X - M}{\sigma}$ $= \dfrac{1100 - 1026}{209}$ $= 0.354$

Z at 0.354 = ~~63.67%~~ 0.6368

Your score is ~~63.68~~ higher than 63.68% of test takers.