2.13

(1) $H_0: P_1 - P_2 \le 0$. $H_1: P_1 - P_2 > 0$

(2) $\alpha = 0.05$

(3) 拒绝域 $C = \{Z > Z_\alpha\} = \{Z > 1.645\}$

(4) $n_1 = 200$ $n_2 = 150$ $X = 108$. $Y = 78$ $\hat{P}_1 = 0.54$, $\hat{P}_2 = 0.52$

$\bar{P} = \frac{X+Y}{n_1+n_2} = \frac{108+78}{200+150} = 0.531$

$$Z = \frac{\hat{P}_1 - \hat{P}_2}{\sqrt{\bar{P}(1-\bar{P})\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}} = \frac{0.54 - 0.52}{\sqrt{0.531(1-0.531)\left(\frac{1}{200}+\frac{1}{150}\right)}} = 0.371.$$