2b. i. 90% conf interval

assume 2 tailed

$z_{0.95} = 1.645$

$\mu \approx 4/5 \qquad \sigma = \sqrt{\frac{16}{1100}}$

$= \sqrt{\frac{4}{275}}$

$= \frac{2}{5\sqrt{11}}$

$= \frac{2\sqrt{11}}{55}$

i. $4/5 \pm 1.645 \cdot \frac{2\sqrt{11}}{55}$

ii. $n = 15 \qquad n\text{-succ} = 9$

Posterior ~ Beta (17, 8)

$\mu' = \frac{17}{25} \qquad \sigma = 0.091483$

$\frac{17}{25} \pm 1.645 \cdot 0.091483$

iii. $H_0: p \leq 0.5$

$H_1: p > 0.5$

given the bayesian distribution of P,
and H_0 places p's upper bound at 0.5,
at the 5% level, the lower bound of the posterior
was $0.52... > 0.5$
since 0.5 fall within critical region,
sufficient evidence to reject H_0