2. (a) ∵ 96% confidence interval

∴ $\alpha = 1 - 0.96 = 0.04$

$1 - \frac{\alpha}{2} = 0.98$

∴ $z_{\frac{\alpha}{2}} = 2.053$

∵ $E = z_{\frac{\alpha}{2}} \frac{s}{\sqrt{N}}$ ∴ $0.4 = 2.053 \cdot \frac{s}{\sqrt{40}}$

$s = 1.234$

∴ sd should be 1.234

(b) ∵ 99% confidence interval

∴ $\alpha = 1 - 0.99$

∴ $z_{\frac{\alpha}{2}} = z_{0.005} = 2.575$

∴ $E = 2.575 \cdot \frac{1.234}{\sqrt{40}} \approx 0.502$

∴ 99% confidence Interval is $[3 - 0.502, 3 + 0.502]$

(c) ∵ 96% confidence interval

$E = 0.1$, $z_{\frac{\alpha}{2}} = 2.053$, $s = 1.234$

∴

$0.1 = 2.053 \cdot \frac{1.234}{\sqrt{N}}$

$N = 637.65 \approx 638$

So we still need to make 598 more samples.