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2.

$$e = \frac{\sigma}{\sqrt{n}} \times Z_{\frac{\alpha}{2}}$$

(1) $\sigma = 3 \quad e = 0.5 \quad 1-\alpha = 0.95$

$$n = \left(\frac{3}{0.5}\right)^2 \times 1.96^2 = 138.3$$

$$\fallingdotseq 139$$

(2) $\sigma = 0.2 \quad e = 0.03 \quad 1-\alpha = 0.9$

$$n = \left(\frac{0.2}{0.03}\right)^2 \times 1.645^2 = 120.27$$

$$\fallingdotseq 121$$

(3) $\sigma = 0.05 \quad e = 0.02 \quad 1-\alpha = 0.98$

$$n = \left(\frac{0.05}{0.02}\right)^2 \times 2.326^2 = 33.8$$

$$\fallingdotseq 34$$