

$$4. n = 2002$$

$$x = 1321$$

$$(a) C.L = 98\%$$

$$Z_c = 2.326$$

$$p = \frac{x}{n} = \frac{1321}{2002} = 0.6598$$

$$C.I = p \pm Z_c \sqrt{\frac{p(1-p)}{n}}$$

$$= 0.6598 \pm 2.326 \sqrt{\frac{0.6598(1-0.6598)}{2002}}$$

$$= 0.6598 \pm 0.0246$$

$$= (0.635, 0.684)$$

$$= (0.64, 0.68)$$

$$(b) \text{ ~~C.I = (0.64, 0.68)~~ }$$

$$C.I = (0.6352, 0.6845)$$

(c) We are 98% confident that the population proportion of all Americans ages 8 to 18 who own a cell phone is between 0.6352 and 0.6845.

5. $\mu = 100$, $\sigma = 15$, $E = 1.2$, $Z_c = 2.576$

$$n = \left(\frac{Z_c \times \sigma}{E} \right)^2$$

$$= \left(\frac{2.576 \times 15}{1.2} \right)^2$$

$$\approx 1037$$

6. $Z_c = 1.96$, $E = 0.03$, $p = 0.5$, $q = 0.5$

$$n = \left(\frac{Z_c}{E} \right)^2 \times p \times q$$

$$= \left(\frac{1.96}{0.03} \right)^2 \times 0.5 \times 0.5$$

$$= 1068$$

7. $Z_c = 2.326$, $E = 0.03$, $p = 0.5$, $q = 0.5$

$$n = \left(\frac{Z_c}{E} \right)^2 \times p \times q$$

$$= \left(\frac{2.326}{0.03} \right)^2 \times 0.5 \times 0.5$$

$$= 1503$$

$$8. Z_c = 1.645, E = 2, S = 5$$

$$n = \left(\frac{Z_c \times S}{E} \right)^2$$

$$= \left(\frac{1.645 \times 5}{2} \right)^2$$

$$= 17$$