

2 Sample Proportion Intervals/Tests

- 1) A grocery store manager notes that in an SRS of 85 people going through the express check-out line, only 10 paid with checks, whereas, in an SRS of 92 customers passing through the regular line, 37 paid with checks. Find a 95% confidence interval estimate for the difference between the proportion of customers going through the two different lines who use checks.
- 2) A pollster wants to determine the difference between the proportions of high-income voters and low-income voters who support a decrease in the capital gains tax. If the answer must be known to within ± 0.02 at the 95% confidence level, what size samples should be taken?

3) Suppose that early in an election campaign a telephone poll of 800 registered voters shows 460 in favor of a particular candidate. Just before election day, a second poll shows only 520 of 1000 registered voters expressing the same preference. At the 10% significance level is there sufficient evidence that the candidate's popularity has decreased?

4) An automobile manufacturer tries two distinct assembly procedures. In a sample of 350 cars coming off the line using the first procedure there are 28 with major defects, while a sample of 500 autos from the second line shows 32 with defects. Is the difference significant at the 10% significance level?

Multiple Choice

1) A researcher plans to investigate the difference between the proportion of psychiatrists and the proportion of psychologists who believe that most emotional problems have their root causes in childhood. How large a sample should be taken (same number for each group) to be 90% certain of knowing the difference to within $\pm .03$?

- (A) 39
- (B) 376
- (C) 752
- (D) 1504
- (E) 3007

2) In a simple random sample of 300 elderly men, 65% were married, while in an independent simple random sample of 400 elderly women, 48% were married. Determine a 99% confidence interval estimate for the difference between the proportions of elderly men and women who are married.

(A) $(.65 - .48) \pm 2.326 \sqrt{\frac{(.65)(.35)}{300} + \frac{(.48)(.52)}{400}}$

(B) $(.65 - .48) \pm 2.576 \sqrt{\frac{(.65)(.35)}{300} + \frac{(.48)(.52)}{400}}$

(C) $(.65 - .48) \pm 2.576 \left(\frac{(.65)(.35)}{\sqrt{300}} + \frac{(.48)(.52)}{\sqrt{400}} \right)$

(D) $\left(\frac{.65 + .48}{2} \right) \pm 2.576 \sqrt{\frac{(.65)(.35)}{300} + \frac{(.48)(.52)}{400}}$

(E) $\left(\frac{.65 + .48}{2} \right) \pm 2.807 \sqrt{(.565)(.435) \left(\frac{1}{300} + \frac{1}{400} \right)}$