

STA 102 Spring 2002
Chapter 14 Solutions to Suggested Even Problems

2,4 not shown

6.

a) $n=25$; $\text{mean}=0.328$; $\text{sd}=\sqrt{0.328*(1-0.328)/25}=0.094$; given that n is sufficiently large the distribution is approximately normal.

b) Since $np=8.2 > 5$ and $n(1-p)=16.8 > 5$ we can apply the normal approx.

$z=1.30$; The area to the right of z is 0.097. Therefore, about 9.7% of the samples will have a sample proportion of 0.45 or larger.

c) $z=-1.36$; The area to the left of z is 0.087. Therefore, about 8.7% of the samples will have a sample proportion of 0.20 or smaller.

d) For $N(0,1)$, $z=-1.28$ cuts off 10% of the curve.

$\hat{p}=(-1.28)(0.094) + 0.328=0.21$. $p=0.21$ cuts off the lower 10% of the distribution.

8.

a) $\hat{p}=0.969$

b) rule of thumb holds so we expect the normal approximation to apply;

95% CI = (0.954, 0.984)

c) If 100 samples of size 488 were drawn from this population and 100 different 95% CIs generated, approximately 95 would contain the true population proportion p and 5 would not.

d) 90% CI = (0.956, 0.982)

e) The 90% CI is shorter than the 95% CI

10.

a) $\hat{p}_1 - \hat{p}_2 = 0.023$

b) 95% CI for difference in proportions is (-0.052, 0.098)

c) $H_0: p_1=p_2$

$H_A: p_1 \neq p_2$

$\hat{p}\text{-hat-pooled} = 0.086$; $z=0.59$; don't reject the null

d) Since the proportions of individuals who quit smoking do not appear to differ in the 2 groups, the advice given by physicians does not appear to be effective.

12.

a) $\hat{p}=(24+28)/(97+161)=0.202$

b) $H_0: p_1 = p_2$; $H_1: p_1 \neq p_2$; $z=1.41$;

Since $p=0.158 > 0.05$ we're unable to reject H_0 .

c) There is not sufficient evidence to conclude that the proportions of positive skin test results differ for those who share needles and those who don't.

d) estimated difference=0.073; Therefore we are 95% confident that the interval (-0.031, 0.177) covers the true difference in proportions.