9.17.

The hypotheses are: H_0: $\mu_1 = \mu_2$
H_A: $\mu_1 \neq \mu_2$

Reject H_0 if $t < -1.7341$ or $t > 1.7341$.

$$s_p = \sqrt{\frac{(10-1)2.898^2 + (10-1)2.703^2}{10+10-2}} = 2.802$$

$$t = \frac{(19.53 - 19.59) - 0}{2.802\sqrt{\frac{1}{10}+\frac{1}{10}}} = -.0479$$: Do not reject H_0.

9.23.

a. If the difference is Sample 1 – Sample 2, the hypotheses are:

H_0: $\mu_d \geq 0$
H_A: $\mu_d < 0$

b. The differences are:

Sample 1	Sample 2	Difference
4.4	3.7	0.7
2.7	3.5	-0.8
1	4	-3
3.5	4.9	-1.4
2.8	3.1	-0.3
2.6	4.2	-1.6
2.4	5.2	-2.8
2	4.4	-2.4
2.8	4.3	-1.5

Using these values find: $\bar{d} = -1.456$
$s_d = 1.2$

The Decision Rule is: Reject if $t < -1.3968$. Using Equation 9-18:

$$t = \frac{-1.456 - 0}{\frac{1.2}{\sqrt{9}}} = -3.64$$

Since $-3.64 < -1.3968$, reject H_0.

Using the p-value approach, the calculated value of –3.64 is less than –3.3544, the smallest value in the t table (adjusting for a lower tail test). Therefore, the p-value $< 0.01 < 0.10 = \alpha$ and the null hypothesis is rejected.

c. The 90% confidence interval is:

$$-1.456 \pm 1.8595(1.2/\sqrt{9} = -2.1998 \text{ ------ } -.7122$$

This confidence interval does not contain 0. Therefore, a value of 0 is not a plausible value for μ_d as was concluded by the hypothesis test.

9.26.

a. H_0: $\mu_C - \mu_R \leq 0.25$
H_A: $\mu_C - \mu_R > 0.25$

df = 25 + 25 – 2 = 48

If $t > 1.677$ reject H_0, otherwise do not reject H_0

$$s_p = \sqrt{\frac{(25-1)0.87^2 + (25-1)0.79^2}{25+25-2}} = 0.8310$$

$$t = ((3.74 - 3.26) - 0.25)/(0.8310\sqrt{(1/25)+(1/25)}\,) = 0.9785$$

Since 0.9785 < 1.677 do not reject H_0 and conclude that the difference is not greater than \$0.25

b. Since you accepted the null hypothesis the type of error that could occur is accepting a false null hypothesis that is a Type II error.

9.37.

a. Decision Rule:

If $z > 2.05$ reject H_0, otherwise do not reject H_0

$$\bar{p} = (30+24)/(60+80) = 0.3857$$

$$\bar{p}_1 = 30/60 = 0.5$$

$$\bar{p}_2 = 24/80 = 0.3$$

$$z = [(0.5 - 0.3)-0]/\ \sqrt{(0.3857)(1-.3857)[(1/60)+(1/80)]} = 2.4059$$

Since $z = 2.4059 > 2.05$ reject H_0, and conclude there is a difference in the population proportions.

b. Looking in the standard normal table we see area associated with $z = 2.41$ is .4920. So the

p-value is .00800 which is less than $\alpha = .02$ and again reject H_0.

9.39.

a. $n_1 \bar{p}_1 = 0.62(745) = 462 > 5$; $n_1 (1 - \bar{p}_1) = 745(1-0.62) = 283 > 5$
$n_2 \bar{p}_2 = 0.49(455) = 223 > 5$; $n_2(1 - \bar{p}_2) = 455(1-0.49) = 232 > 5$ Since both are greater than 5, the normal approximation is appropriate.

b. H_0: $p_1 - p_2 = 0$
H_A: $p_1 - p_2 \neq 0$

Decision Rule:
If $z > 1.96$ or $z < -1.96$ reject H_0, otherwise do not reject H_0

$\bar{p} = (462+223)/(745+455) = 0.5708$

$$z = [(0.62 - 0.49)-0]/\sqrt{(0.5708)(1-.5708)[(1/745)+(1/455)]} = 4.414$$

Since $z = 4.414 > 1.96$ reject H_0, and conclude that there is a difference in the proportion of homes that watch a national news broadcast.