the proportion of managers. Identify the test statistic and *P*-value. If using a 0.01 significance level, what should you conclude about the claim?

MINITAB

```
Difference = p (1) - p (2)
Estimate for difference:  0.109788
95% CI for difference:  (0.0138876, 0.205689)
Test for difference = 0 (vs not = 0):  Z = 2.17  P-Value = 0.030
```

Testing Claims About Proportions. ***In Exercises 7–18, test the given claim. Identify the null hypothesis, alternative hypothesis, test statistic, P-value or critical value(s), conclusion about the null hypothesis, and final conclusion that addresses the original claim.***

7. Dreaming in Black and White A study was conducted to determine the proportion of people who dream in black and white instead of color. Among 306 people over the age of 55, 68 dream in black and white, and among 298 people under the age of 25, 13 dream in black and white (based on data from "Do We Dream in Color?" by Eva Murzyn, *Consciousness and Cognition*, Vol. 17, No. 4). We want to use a 0.01 significance level to test the claim that the proportion of people over 55 who dream in black and white is greater than the proportion for those under 25.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. An explanation given for the results is that those over the age of 55 grew up exposed to media that was mostly displayed in black and white. Can the results from parts (a) and (b) be used to verify that explanation?

8. Ginkgo for Dementia The herb ginkgo biloba is commonly used as a treatment to prevent dementia. In a study of the effectiveness of this treatment, 1545 elderly subjects were given ginkgo and 1524 elderly subjects were given a placebo. Among those in the ginkgo treatment group, 246 later developed dementia, and among those in the placebo group, 277 later developed dementia (based on data from "Ginkgo Biloba for Prevention of Dementia," by DeKosky et al., *Journal of the American Medical Association,* Vol. 300, No. 19). We want to use a 0.01 significance level to test the claim that ginkgo is effective in preventing dementia.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. Based on the results, is ginkgo effective in preventing dementia?

9. Are Seat Belts Effective? A simple random sample of front-seat occupants involved in car crashes is obtained. Among 2823 occupants not wearing seat belts, 31 were killed. Among 7765 occupants wearing seat belts, 16 were killed (based on data from "Who Wants Airbags?" by Meyer and Finney, *Chance,* Vol. 18, No. 2). We want to use a 0.05 significance level to test the claim that seat belts are effective in reducing fatalities.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. What does the result suggest about the effectiveness of seat belts?

10. Cardiac Arrest at Day and Night A study investigated survival rates for in-hospital patients who suffered cardiac arrest. Among 58,593 patients who had cardiac arrest during the day, 11,604 survived and were discharged. Among 28,155 patients who suffered cardiac arrest at night, 4139 survived and were discharged (based on data from "Survival from