1. (SEC 9.1: 9.8) What is the p-value if, in a two-tail hypothesis test, $Z_{STAT} = -1.38$?

   (a) 0.1676
   (b) 0.8324
   (c) 0.0838
   (d) 0.9162
   (e) 0.4162

2. (SEC 9.2: 9.25) A manufacturer of chocolate candies uses machines to package candies as they move along a filling line. Although the packages are labeled as 8 ounces, the company wants the packages to contain a mean of 8.17 ounces so that virtually none of the packages contain less than 8 ounces. A sample of 50 packages is selected periodically, and the packaging process is stopped if there is evidence that the mean amount packaged is different from 8.17 ounces. Suppose that in a particular sample of 50 packages, the mean amount dispensed is 8.159 ounces, with a sample standard deviation of 0.051 ounce. Is there evidence that the population mean amount is different from 8.17 ounces? (Use a 0.05 level of significance.)

   (a) Since $|t_{STAT}| < 2.01$, do not reject H_0.
   (b) Since $|t_{STAT}| < 2.01$, reject H_0.
   (c) Since $|t_{STAT}| > 2.01$, do not reject H_0.
   (d) Since $|t_{STAT}| > 2.01$, reject H_0.
   (e) Since $|t_{STAT}| > -2.01$, reject H_0.

3. (SEC 9.4: 9.55) The U.S. Department of Education reports that 46% of full-time college students are employed while attending college. A recent survey of 60 full-time students at Miami University found that 29 were employed. Use the p-value approach to hypothesis testing and a 0.05 level of significance to determine whether the proportion of full-time students at Miami University is different from the national norm of 0.46. What is the value of the test, p-value and the final decision (in order)?

   (a) Test value= 0.3626; p-value = 0.7188; do not reject H_0 as p-value > 0.05
   (b) Test value= -2.1758; p-value = 0.0296; reject H_0 as p-value < 0.05
   (c) Test value= -2.1758; p-value = 0.9704; reject H_0 as p-value > 0.05
   (d) Test value= 2.1758; p-value = 0.9704; don't reject H_0 as p-value > 0.05
   (e) Test value= 2.1758; p-value = 0.0296; don't reject H_0 as p-value < 0.05

4. SEC 8.4: 8.41) If the inspection division of a county weights and measures department wants to estimate the mean amount of soft-drink fill in 2-liter bottles to within ± 0.01 liter with 95% confidence and also assumes that the standard deviation is 0.05 liter, what sample size is needed?

   (a) 97
   (b) 96
   (c) 96.04
   (d) 95
   (e) 100

5. (7.36) What is the difference between a population distribution and a sampling distribution?

   (a) The population distribution is the distribution of a particular variable of interest, while the sampling distribution represents the distribution of a statistic.
   (b) The population distribution is the distribution of a particular variable of interest, while the sampling distribution represents the distribution of a parameter.
   (c) The population distribution is the distribution of a particular parameter, while the sampling distribution represents the distribution of a statistic.
   (d) The population distribution is the distribution of a statistic, while the sampling distribution represents the distribution of a particular variable of interest.
   (e) The population distribution is a discrete distribution, while the sampling distribution is a continuous distribution.

6. (10.18) An experimental design for a paired t test has 20 pairs of identical twins. How many degrees of freedom are there in this t test?

   (a) 19
   (b) 20
   (c) 18
   (d) 17
   (e) 21

7. (Problem 10.27) Let $n_1 = 100$, $X_1 = 50$, $n_2 = 100$, and $X_2 = 30$. At the 0.05 level of significance, is there evidence of a significant difference between the two population proportions?

   What is value of test, p-value. and final decision (in order)?

   (a) Test value= 2.89; p-value $= 0.00386$; reject H_0 as p-value < 0.05
   (b) Test value= -2.89; p-value $= 0.00386$; reject H_0 as p-value < 0.05
   (c) Test value= -2.89; p-value $= 0.99614$; don't reject H_0 as p-value > 0.05
   (d) Test value= 2.89; p-value $= 0.00386$; don't reject H_0 as p-value < 0.05
   (e) Test value= 2.89; p-value $= 0.00193$; reject H_0 as p-value < 0.05

8. (10.38) The following information is available for two samples selected from independent normally distributed populations:

   Population A: $n_1 = 25 \quad S_1^2 = 16$

   Population B: $n_2 = 25 \quad S_2^2 = 25$

   What is the value of F_{STAT}?

   (a) 1.5625
   (b) 0.64
   (c) 1.25
   (d) 0.8
   (e) 1.0

9. (Problem 10.43) The following information is available for two samples selected from independent but very right-skewed populations:

   Population A: $n_1 = 16 \quad S_1^2 = 47.3$

   Population B: $n_2 = 13 \quad S_2^2 = 36.4$

   Suppose that you want to perform a one-tail test. At the 0.05 level of significance, what is the upper-tail critical value of F to determine whether there is evidence that $\sigma_1^2 > \sigma_2^2$?

   (a) 2.62
   (b) 2.48
   (c) 3.18
   (d) 2.96
   (e) 1.96

10. (Sec 12.1: Q12.10) How do Americans feel about ads on websites? A survey of 1,000 adult Internet users found that 670 opposed ads on websites. Suppose that a survey of 1,000 Internet users age 12–17 found that 510 opposed ads on websites. a. At the 0.05 level of significance, is there evidence of a difference between adult Internet users and Internet users age 12–17 in the proportion who oppose ads?

    (a) Test value= 52.9144; critical-value = 3.841; reject H_0 as test value lies in rejection region
    (b) Test value= 52.9144; critical-value = 3.841; don't reject H_0 as test value lies in rejection region
    (c) Test value= 52.9144; critical-value = 0.004; don't reject H_0 as test value lies in acceptance region
    (d) Test value= 52.9144; critical-value = 9.488; reject H_0 as test value lies in rejection region
    (e) Test value= 5.29144; critical-value = 9.488; don't reject H_0 as test value lies in acceptance region

11. (Problem 12.24) A large corporation is interested in determining whether a relationship exists between the commuting time of its employees and the level of stress-related problems observed on the job. A study of 116 workers reveals the following:

	STRESS LEVEL			
COMMUTING TIME	High	Moderate	Low	Total
Under 15 min.	9	5	18	32
15-45 min.	17	8	28	53
Over 45 min.	18	6	7	31
Total	44	19	53	116

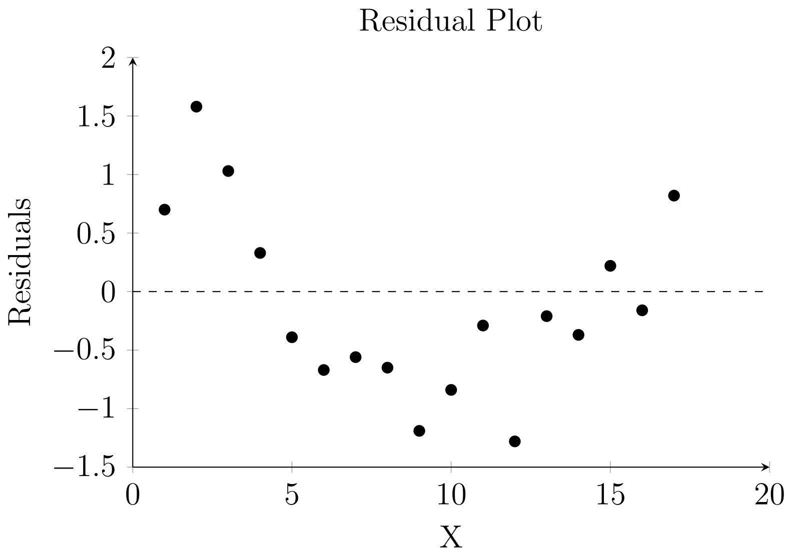
At the 0.01 level of significance, is there evidence of a significant relationship between commuting time and stress level?

(a) Since $\chi^2_{STAT} = 9.831$ is less than the critical bound of 13.277, do not reject H_0.
(b) Since $\chi^2_{STAT} = 9.831$ is less than the critical bound of 13.277, reject H_0.
(c) Since $\chi^2_{STAT} = 9.831$ is less than the critical bound of 21.666, do not reject H_0.
(d) Since $\chi^2_{STAT} = 9.831$ is more than the critical bound of 0.297, reject H_0.
(e) Since $\chi^2_{STAT} = 0.9831$ is less than the critical bound of 13.277, do not reject H_0.

12. (Problem 13.14) If $SSE = 10$ and $SSR = 30$, compute the coefficient of determination, r^2, and interpret its meaning.

(a) $R^2 = 0.75$. So, 75% of the variation in Y can be explained by the variation in the predictor(s).
(b) $R^2 = 0.75$. So, 75% of the variation in Y cannot be explained by the variation in the predictor(s).
(c) $R^2 = 0.25$. So, 25% of the variation in Y can be explained by the variation in the predictor(s).
(d) $R^2 = 0.33$. So, 33% of the variation in Y can be explained by the variation in the predictor(s).
(e) $R^2 = 3$. So, 30% of the variation in Y can be explained by the variation in the predictor(s).

13. (Problem 13.24) The following results show a residual plot from a regression analysis:



What do you conclude from the information given?

(a) The pattern indicates a violation of the assumption of linearity.
(b) The pattern indicates a violation of the assumption of normality.
(c) The pattern indicates a violation of the assumption of constant variance.
(d) This pattern indicates a violation of the assumption of independence.
(e) The assumptions of regression appear to be met.

14. (Problem 13.40) You are testing the null hypothesis that there is no linear relationship between two variables, X and Y. From your sample of $n = 18$, you determine that $b_1 = +4.5$ and $S_{b_1} = 1.5$. Construct a 95% confidence interval estimate of the population slope, β_1.

(a) $1.32 \leq \beta_1 \leq 7.68$
(b) $13.2 \leq \beta_1 \leq 76.8$
(c) $-1.32 \leq \beta_1 \leq 7.68$
(d) $-3 \leq \beta_1 \leq 3$
(e) $3 \leq \beta_1 \leq 6$

15. (Problem 13.55) Based on a sample of $n = 20$, the least-squares method was used to develop the following prediction line: $\hat{Y}_i = 5 + 3X_i$.

In addition,

$S_{YX} = 1.0 \qquad \bar{X} = 2 \qquad \sum_{i=1}^{n}(X_i - \bar{X})^2 = 20$

a. Construct a 95% confidence interval estimate of the population mean response for $X = 2$.

(a) $10.53 \leq \mu_{YX} \leq 11.47$
(b) $8.847 \leq \mu_{YX} \leq 13.153$
(c) $15.95 \leq \mu_{YX} \leq 18.05$
(d) $14.651 \leq \mu_{YX} \leq 19.349$
(e) $1.053 \leq \mu_{YX} \leq 1.147$

16. (Problem 14.2) For this problem, use the following multiple regression equation:

$\hat{Y}_i = 50 - 2X_{1i} + 7X_{2i}$

Which statement is correct about the Y intercept.

(a) The Y-intercept 50 is the estimate of the mean value of Y if X_1 and X_2 are both 0.
(b) The Y-intercept 50 is the estimate of the mean value of Y if X_1 and X_2 are both 50.
(c) The Y-intercept 50 is the estimate of the mean value of Y if $X_1 = 1$ and $X_2 = 1$.
(d) Holding constant the effect of X_1, for each increase of one unit in X_2, the response variable Y is estimated to increase an average of 50 units.
(e) Holding constant the effect of X_2, for each increase of one unit in X_1, the response variable Y is estimated to increase an average of 2 units.

17. (Problem 14.10) The following ANOVA summary table is for a multiple regression model with two independent variables:

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F
Regression	2	30		
Error	10	120		
Total	12	150		

Determine whether there is a significant relationship between Y and the two independent variables at the 0.05 level of significance.

(a) There is not sufficient evidence of a significant linear relationship, as $F_{STAT} = 1.25 < F_{Table} = 4.10$

(b) There is sufficient evidence of a significant linear relationship, as $F_{STAT} = 1.25 < F_{Table} = 4.10$

(c) There is not sufficient evidence of a significant linear relationship, as $F_{STAT} = 1.25 < F_{Table} = 19.40$

(d) There is not sufficient evidence of a significant linear relationship, as $F_{STAT} = 1.25 < F_{Table} = 5.46$

(e) There is sufficient evidence of a significant linear relationship, as $F_{STAT} = 1.25 > F_{Table} = 0.4103$

18. (Sec 16.3: Q16. 2) Consider a nine-year moving average used to smooth a time series that was first recorded in 2002.How many years of values in the series are lost when computing all the nine-year moving averages?

(a) 8

(b) 4

(c) 9

(d) 6

(e) 0

19. (Problem 16.3) You are using exponential smoothing on an annual time series concerning total revenues (in millions of dollars). You decide to use a smoothing coefficient of $W = 0.20$, and the exponentially smoothed value for 2010 is $E_{2010} = (0.20)(12.1) + (0.80)(9.4)$.

    What is the smoothed value of this series in 2011 if the value of the series in that year is 11.5?

    (a) 10.25
    (b) 9.94
    (c) 7.952
    (d) 2.3
    (e) 9.4

20. (Problem 16.67) The following are prices and consumption quantities for three commodities in 1995 and 2015:

COMMODITY	1995 Price, Quantity	2015 Price, Quantity
A	$2, 20	$3, 21
B	$18, 3	$36, 2
C	$3, 18	$4, 23

    Calculate the Paasche aggregate price index for 2015, using 1995 as the base year.

    (a) 154.42
    (b) 162.16
    (c) 186.96
    (d) 87.5
    (e) 100