Practice for chapter 9 and 10
Disclaimer: the actual exam does not mirror this. This is meant for practicing questions only. The actual exam in not multiple choice.

Find the number of successes x suggested by the given statement.

1) A computer manufacturer randomly selects 2850 of its computers for quality assurance and finds that 1.79% of these computers are found to be defective.
A) 51 B) 54 C) 56 D) 49

Assume that you plan to use a significance level of $\alpha = 0.05$ to test the claim that $p_1 = p_2$. Use the given sample sizes and numbers of successes to find the pooled estimate $\bar{p}$. Round your answer to the nearest thousandth.

2) $n_1 = 100$ $n_2 = 100$
$\hat{p}_1 = 0.18$ $\hat{p}_2 = 0.12$
A) 0.150 B) 0.387 C) 0.300 D) 0.188

3) $n_1 = 570$ $n_2 = 1992$
$x_1 = 143$ $x_2 = 550$
A) 0.270 B) 0.541 C) 0.520 D) 0.216

Assume that you plan to use a significance level of $\alpha = 0.05$ to test the claim that $p_1 = p_2$. Use the given sample sizes and numbers of successes to find the z test statistic for the hypothesis test.

4) A report on the nightly news broadcast stated that 10 out of 108 households with pet dogs were burglarized and 20 out of 208 without pet dogs were burglarized.
A) z = –0.102 B) z = 0.000 C) z = –0.173 D) z = –0.041

5) A random sampling of sixty pitchers from the National League and fifty–two pitchers from the American League showed that 19 National and 11 American League pitchers had E.R.A's below 3.5.
A) z = 1.253 B) z = 1.629 C) z = 15.457 D) z = 191.183

Solve the problem.

6) The table shows the number satisfied in their work in a sample of working adults with a college education and in a sample of working adults without a college education. Assume that you plan to use a significance level of $\alpha = 0.05$ to test the claim that $p_1 > p_2$. Find the critical value(s) for this hypothesis test. Do the data provide sufficient evidence that a greater proportion of those with a college education are satisfied in their work?

	College Education	No College Education
Number in sample	143	133
Number satisfied in their work	71	66

A) z = 1.645; no B) z = –1.645; yes C) z = ± 1.96; no D) z = 1.96; yes

Assume that you plan to use a significance level of $\alpha = 0.05$ to test the claim that $p_1 = p_2$. Use the given sample sizes and numbers of successes to find the P–value for the hypothesis test.

7) $n_1 = 50$ $n_2 = 75$
$x_1 = 20$ $x_2 = 15$
A) 0.0146 B) 0.0032 C) 0.1201 D) 0.0001

8) $n_1 = 50$ $n_2 = 50$
$x_1 = 8$ $x_2 = 7$

A) 0.7794 B) 0.6103 C) 0.3897 D) 0.2206

Use the traditional method to test the given hypothesis. Assume that the samples are independent and that they have been randomly selected

9) A marketing survey involves product recognition in New York and California. Of 558 New Yorkers surveyed, 193 knew the product while 196 out of 614 Californians knew the product. At the 0.05 significance level, test the claim that the recognition rates are the same in both states.

10) In a random sample of 500 people aged 20–24, 22% were smokers. In a random sample of 450 people aged 25–29, 14% were smokers. Test the claim that the proportion of smokers in the two age groups is the same. Use a significance level of 0.01.

11) Use the given sample data to test the claim that $p_1 < p_2$. Use a significance level of 0.10.

Sample 1	Sample 2
$n_1 = 462$	$n_2 = 380$
$x_1 = 84$	$x_2 = 95$

Construct the indicated confidence interval for the difference between population proportions $p_1 - p_2$. Assume that the samples are independent and that they have been randomly selected.

12) $x_1 = 36$, $n_1 = 64$ and $x_2 = 47$, $n_2 = 71$; Construct a 95% confidence interval for the difference between population proportions $p_1 - p_2$.

A) $-0.263 < p_1 - p_2 < 0.064$ B) $-0.294 < p_1 - p_2 < 0.757$
C) $0.399 < p_1 - p_2 < 0.726$ D) $0.368 < p_1 - p_2 < 0.757$

13) In a random sample of 500 people aged 20–24, 22% were smokers. In a random sample of 450 people aged 25–29, 14% were smokers. Construct a 95% confidence interval for the difference between the population proportions $p_1 - p_2$.

A) $0.032 < p_1 - p_2 < 0.128$ B) $0.035 < p_1 - p_2 < 0.125$
C) $0.025 < p_1 - p_2 < 0.135$ D) $0.048 < p_1 - p_2 < 0.112$

Determine whether the samples are independent or dependent.

14) The effectiveness of a new headache medicine is tested by measuring the amount of time before the headache is cured for patients who use the medicine and another group of patients who use a placebo drug.

A) Independent samples B) Dependent samples

15) The effectiveness of a headache medicine is tested by measuring the intensity of a headache in patients before and after drug treatment. The data consist of before and after intensities for each patient.

A) Dependent samples B) Independent samples

Test the indicated claim about the means of two populations. Assume that the two samples are independent simple random samples selected from normally distributed populations. Do not assume that the population standard deviations are equal. Use the traditional method or P–value method as indicated.

16) A researcher wishes to determine whether people with high blood pressure can reduce their blood pressure, measured in mm Hg, by following a particular diet. Use a significance level of 0.01 to test the claim that the treatment group is from a population with a smaller mean than the control group. Use the traditional method of hypothesis testing.

Treatment Group	Control Group
$n_1 = 35$	$n_2 = 28$
$\bar{x}1 = 189.1$	$\bar{x}2 = 203.7$
$s_1 = 38.7$	$s_2 = 39.2$

17) A researcher was interested in comparing the salaries of female and male employees at a particular company. Independent simple random samples of 8 female employees and 15 male employees yielded the following weekly salaries (in dollars).

Female	Male	
495	722	518
760	562	904
556	880	1150
904	520	805
520	500	480
1005	1250	970
743	750	605
660	1640	

Use a 0.05 significance level to test the claim that the mean salary of female employees is less than the mean salary of male employees. Use the traditional method of hypothesis testing.

(Note: $\bar{x}_1 = \$705.375$, $\bar{x}_2 = \$817.067$, $s_1 = \$183.855$, $s_2 = \$330.146$.)

18) A researcher wishes to determine whether the blood pressure of vegetarians is, on average, lower than the blood pressure of nonvegetarians. Independent simple random samples of 85 vegetarians and 75 nonvegetarians yielded the following sample statistics for systolic blood pressure:

Vegetarians	Nonvegetarians
$n_1 = 85$	$n_2 = 75$
$\bar{x}1 = 124.1$ mmHg	$\bar{x}2 = 138.7$ mmHg
$s_1 = 38.7$ mmHg	$s_2 = 39.2$ mmHg

Use a significance level of 0.01 to test the claim that the mean systolic blood pressure of vegetarians is lower than the mean systolic blood pressure of nonvegetarians. Use the P–value method of hypothesis testing.

Construct the indicated confidence interval for the difference between the two population means. Assume that the two samples are independent simple random samples selected from normally distributed populations. Do not assume that the population standard deviations are equal.

19) Independent samples from two different populations yield the following data. $\bar{x}1 = 236$, $\bar{x}2 = 905$, $s_1 = 88$, $s_2 = 13$. The sample size is 381 for both samples. Find the 85% confidence interval for $\mu_1 - \mu_2$.

A) $-676 < \mu_1 - \mu_2 < -662$

B) $-677 < \mu_1 - \mu_2 < -661$

C) $-670 < \mu_1 - \mu_2 < -668$

D) $-683 < \mu_1 - \mu_2 < -655$

20) A researcher was interested in comparing the amount of time spent watching television by women and by men. Independent simple random samples of 14 women and 17 men were selected, and each person was asked how many hours he or she had watched television during the previous week. The summary statistics are as follows.

Women	Men
$\bar{x}_1 = 12.5$ hrs	$\bar{x}_2 = 14.3$ hrs
$s_1 = 3.9$ hrs	$s_2 = 5.2$ hrs
$n_1 = 14$	$n_2 = 17$

Construct a 99% confidence interval for $\mu_1 - \mu_2$, the difference between the mean amount of time spent watching television for women and the mean amount of time spent watching television for men.

A) -6.31 hrs $< \mu_1 - \mu_2 < 2.71$ hrs

B) -6.32 hrs $< \mu_1 - \mu_2 < 2.72$ hrs

C) -6.45 hrs $< \mu_1 - \mu_2 < 2.85$ hrs

D) -6.44 hrs $< \mu_1 - \mu_2 < 2.84$ hrs

21) A researcher was interested in comparing the salaries of female and male employees at a particular company. Independent simple random samples of 8 female employees and 15 male employees yielded the following weekly salaries (in dollars).

Female	Male	
495	722	518
760	562	904
556	880	1150
904	520	805
520	500	480
1005	1250	970
743	750	605
660	1640	

Construct a 98% confidence interval for $\mu_1 - \mu_2$, the difference between the mean weekly salary of female employees and the mean weekly salary of male employees at the company.

(Note: $\bar{x}_1 = \$705.38$, $\bar{x}_2 = \$817.07$, $s_1 = \$183.86$, $s_2 = \$330.15$.)

A) $-\$382 < \mu_1 - \mu_2 < \$158$

B) $-\$383 < \mu_1 - \mu_2 < \$159$

C) $-\$431 < \mu_1 - \mu_2 < \$208$

D) $-\$385 < \mu_1 - \mu_2 < \$164$

State what the given confidence interval suggests about the two population means.

22) A paint manufacturer made a modification to a paint to speed up its drying time. Independent simple random samples of 11 cans of type A (the original paint) and 9 cans of type B (the modified paint) were selected and applied to similar surfaces. The drying times, in hours, were recorded. The summary statistics are as follows.

Type A	Type B
$\bar{x}_1 = 74.9$ hrs	$\bar{x}_2 = 63.9$ hrs
$s_1 = 4.5$ hrs	$s_2 = 5.1$ hrs
$n_1 = 11$	$n_2 = 9$

The following 98% confidence interval was obtained for $\mu_1 - \mu_2$, the difference between the mean drying time for paint cans of type A and the mean drying time for paint cans of type B: $4.70 \text{ hrs} < \mu_1 - \mu_2 < 17.30 \text{ hrs}$

What does the confidence interval suggest about the population means?

A) The confidence interval includes only positive values which suggests that the mean drying time for paint type A is greater than the mean drying time for paint type B. The modification seems to be effective in reducing drying times.

B) The confidence interval includes only positive values which suggests that the two population means might be equal. There doesn't appear to be a significant difference between the mean drying time for paint type A and the mean drying time for paint type B. The modification does not seem to be effective in reducing drying times.

C) The confidence interval includes 0 which suggests that the two population means might be equal. There doesn't appear to be a significant difference between the mean drying time for paint type A and the mean drying time for paint type B. The modification does not seem to be effective in reducing drying times.

D) The confidence interval includes only positive values which suggests that the mean drying time for paint type A is smaller than the mean drying time for paint type B. The modification does not seem to be effective in reducing drying times.

Perform the indicated hypothesis test. Assume that the two samples are independent simple random samples selected from normally distributed populations. Also assume that the population standard deviations are equal ($\sigma_1 = \sigma_2$), so that the standard error of the difference between means is obtained by pooling the sample variances .

23) A researcher was interested in comparing the resting pulse rates of people who exercise regularly and the pulse rates of those who do not exercise regularly. Independent simple random samples of 16 people who do not exercise regularly and 12 people who exercise regularly were selected, and the resting pulse rates (in beats per minute) were recorded. The summary statistics are as follows.

Do Not Exercise	Do Exercise
$\bar{x}_1 = 72.1$ beats/min	$\bar{x}_2 = 68.7$ beats/min
$s_1 = 10.9$ beats/min	$s_2 = 8.9$ beats/min
$n_1 = 16$	$n_2 = 12$

Use a 0.025 significance level to test the claim that the mean resting pulse rate of people who do not exercise regularly is greater than the mean resting pulse rate of people who exercise regularly. Use the traditional method of hypothesis testing.

24) A researcher wishes to determine whether the blood pressure of vegetarians is, on average, lower than the blood pressure of nonvegetarians. Independent simple random samples of 85 vegetarians and 75 nonvegetarians yielded the following sample statistics for systolic blood pressure:

Vegetarians	Nonvegetarians
$n_1 = 85$	$n_2 = 75$
$\bar{x}_1 = 124.1$ mmHg	$\bar{x}_2 = 138.7$ mmHg
$s_1 = 38.7$ mmHg	$s_2 = 39.2$ mmHg

Use a significance level of 0.01 to test the claim that the mean systolic blood pressure for vegetarians is lower than the mean systolic blood pressure for nonvegetarians. Use the P–value method of hypothesis testing.

Construct the indicated confidence interval for the difference between the two population means. Assume that the two samples are independent simple random samples selected from normally distributed populations. Also assume that the population standard deviations are equal ($\sigma_1 = \sigma_2$), so that the standard error of the difference between means is obtained by pooling the sample variances .

25) A paint manufacturer wanted to compare the drying times of two different types of paint. Independent simple random samples of 11 cans of type A and 9 cans of type B were selected and applied to similar surfaces. The drying times, in hours, were recorded. The summary statistics are as follows.

Type A	Type B
$\bar{x}_1 = 70.9$ hr	$\bar{x}_2 = 68.4$ hr
$s_1 = 3.7$ hr	$s_2 = 3.2$ hr
$n_1 = 11$	$n_2 = 9$

Construct a 99% confidence interval for $\mu_1 - \mu_2$, the difference between the mean drying time for paint type A and the mean drying time for paint type B.

A) $-2.01 \text{ hrs} < \mu_1 - \mu_2 < 7.01 \text{ hrs}$

B) $-1.50 \text{ hrs} < \mu_1 - \mu_2 < 6.50 \text{ hrs}$

C) $-2.73 \text{ hrs} < \mu_1 - \mu_2 < 7.73 \text{ hrs}$

D) $-0.64 \text{ hrs} < \mu_1 - \mu_2 < 5.64 \text{ hours}$

26) A researcher was interested in comparing the GPAs of students at two different colleges. Independent simple random samples of 8 students from college A and 13 students from college B yielded the following GPAs.

College A	College B	
3.7	3.8	2.8
3.2	3.2	4.0
3.0	3.0	3.6
2.5	3.9	2.6
2.7	3.8	4.0
3.6	2.5	3.6
2.8	3.9	
3.4		

Construct a 95% confidence interval for the difference between the mean GPA of college A students and the mean GPA of college B students.

(Note: $\bar{x}_1 = 3.1125$, $\bar{x}_2 = 3.4385$, $s_1 = 0.4357$, $s_2 = 0.5485$.)

A) $-0.81 < \mu_1 - \mu_2 < 0.15$

B) $-0.72 < \mu_1 - \mu_2 < 0.07$

C) $-0.91 < \mu_1 - \mu_2 < 0.25$

D) $-0.65 < \mu_1 - \mu_2 < -0.01$

The two data sets are dependent. Find $\bar{d}$ to the nearest tenth.

27)

A	58	62	64	63	51
B	27	26	20	25	22

A) 35.6 B) 21.4 C) 44.5 D) 46.3

28)

X	11.2	11.3	11.6	12.9	10.6
Y	11.1	12.6	12.9	10.7	13.3

A) –0.6 B) –0.4 C) –0.7 D) –0.8

Find s_d.

29) The differences between two sets of dependent data are –3, 4, –4, 3. Round to the nearest tenth.

A) 4.1 B) 3.3 C) 94.3 D) 2.1

Assume that you want to test the claim that the paired sample data come from a population for which the mean difference is $\mu_d = 0$. Compute the value of the t test statistic. Round intermediate calculations to four decimal places as needed and final answers to three decimal places as needed.

30) A farmer has decided to use a new additive to grow his crops. He divided his farm into 10 plots and kept records of the corn yield (in bushels) before and after using the additive. The results are shown below.

Plot:	1	2	3	4	5	6	7	8	9	10
Before	9	9	8	7	6	8	5	9	10	11
After	10	9	9	8	7	10	6	10	10	12

You wish to test the following hypothesis at the 1 percent level of significance.

H_0: $\mu_d = 0$ against H_1: $\mu_d \neq 0$.

What is the value of the appropriate test statistic?

A) 5.014 B) 2.536 C) 2.033 D) 1.584

31)

x	8	4.4	4.2	8.8	5.9	12.1	8.5	7.7
y	6.2	4.1	5.3	4.1	6.3	6.8	4.6	6

A) t = 2.391 B) t = 0.845 C) t = 6.792 D) t = 0.998

Determine the decision criterion for rejecting the null hypothesis in the given hypothesis test; i.e., describe the values of the test statistic that would result in rejection of the null hypothesis.

32) Suppose you wish to test the claim that μ_d, the mean value of the differences d for a population of paired data, is greater than 0. Given a sample of n = 15 and a significance level of $\alpha = 0.01$, what criterion would be used for rejecting the null hypothesis?

A) Reject null hypothesis if test statistic > 2.624.

B) Reject null hypothesis if test statistic < 2.624.

C) Reject null hypothesis if test statistic > 2.602.

D) Reject null hypothesis if test statistic > 2.977 or < –2.977.

33) A farmer has decided to use a new additive to grow his crops. He divided his farm into 10 plots and kept records of the corn yield (in bushels) before and after using the additive. The results are shown below.

Plot:	1	2	3	4	5	6	7	8	9	10
Before	9	9	8	7	6	8	5	9	10	11
After	10	9	9	8	7	10	6	10	10	12

You wish to test the following hypothesis at the 10 percent level of significance.

$H_0: \mu_d = 0$ against $H_1: \mu_d \neq 0$.

What decision rule would you use?

A) Reject H_0 if test statistic is less than –1.833 or greater than 1.833.

B) Reject H_0 if test statistic is greater than –1.833 or less than 1.833.

C) Reject H_0 if test statistic is greater than 1.833.

D) Reject H_0 if test statistic is less than –1.833.

Construct a confidence interval for μ_d, the mean of the differences d for the population of paired data. Assume that the population of paired differences is normally distributed.

34) Using the sample paired data below, construct a 90% confidence interval for the population mean of all differences x – y.

x	3.3	5.6	3.5	5.2	6.2
y	3.0	4.4	3.1	5.9	3.9

A) $-0.37 < \mu_d < 1.77$ B) $0.22 < \mu_d < 7.48$ C) $-0.07 < \mu_d < 1.47$ D) $-0.31 < \mu_d < 1.71$

Use the traditional method of hypothesis testing to test the given claim about the means of two populations. Assume that two dependent samples have been randomly selected from normally distributed populations.

35) The table below shows the weights of seven subjects before and after following a particular diet for two months.

Subject	A	B	C	D	E	F	G
Before	190	153	183	161	154	153	167
After	183	144	181	166	140	155	155

Using a 0.01 level of significance, test the claim that the diet is effective in reducing weight.

36) Five students took a math test before and after tutoring. Their scores were as follows.

Subject	A	B	C	D	E
Before	71	66	75	78	66
After	75	75	73	81	78

Using a 0.01 level of significance, test the claim that the tutoring has an effect on the math scores.

Test the indicated claim about the variances or standard deviations of two populations. Assume that both samples are independent simple random samples from populations having normal distributions.

37) Use the summary statistics below to test the claim that the samples come from populations with different variances. Use a significance level of 0.05.

Sample A	Sample B
$n = 28$	$n = 41$
$\bar{x}_1 = 19.2$	$\bar{x}_2 = 23.7$
$s = 5.2$	$s = 5.28$

38) A researcher obtained independent random samples of men from two different towns. She recorded the weights of the men. The results are summarized below:

Town A	Town B
$n_1 = 41$	$n_2 = 21$
$x_1 = 165.1$ lb	$x_2 = 159.5$ lb
$s_1 = 29.8$ lb	$s_2 = 26.1$ lb

Use a 0.05 significance level to test the claim that there is more variation in weights of men from town A than in weights of men from town B.

39) The manager of a juice bottling factory is considering installing a new juice bottling machine which she hopes will reduce the amount of variation in the volumes of juice dispensed into 8–fluid–ounce bottles. Random samples of 10 bottles filled by the old machine and 9 bottles filled by the new machine yielded the following volumes of juice (in fluid ounces).

Old machine: 8.1, 8.0, 7.9, 8.2, 8.5, 8.1, 8.1, 8.2, 7.8, 7.9
New machine: 8.0, 8.1, 8.0, 8.1, 7.9, 8.0, 7.9, 8.0, 8.1

Use a 0.05 significance level to test the claim that the volumes of juice filled by the old machine vary more than the volumes of juice filled by the new machine.
(*Note*: $s_1 = 0.1989$ fl oz, $s_2 = 0.0782$ fl oz)

Given the linear correlation coefficient r and the sample size n, determine the critical values of r and use your finding to state whether or not the given r represents a significant linear correlation. Use a significance level of 0.05.

40) $r = -0.242$, $n = 90$
A) Critical values: $r = \pm 0.207$, significant linear correlation
B) Critical values: $r = \pm 0.207$, no significant linear correlation
C) Critical values: $r = \pm 0.217$, no significant linear correlation
D) Critical values: $r = 0.217$, significant linear correlation

41) $r = 0.523$, $n = 25$
A) Critical values: $r = \pm 0.396$, significant linear correlation
B) Critical values: $r = \pm 0.396$, no significant linear correlation
C) Critical values: $r = \pm 0.487$, significant linear correlation
D) Critical values: $r = \pm 0.487$, no significant linear correlation

Find the value of the linear correlation coefficient r.

42)

x	57	53	59	61	53	56	60
y	156	164	163	177	159	175	151

A) 0.109 B) –0.054 C) 0.214 D) –0.078

43) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test.

Hours	5	10	4	6	10	9
Score	64	86	69	86	59	87

A) 0.224 B) –0.224 C) 0.678 D) –0.678

44) A study was conducted to compare the average time spent in the lab each week versus course grade for computer programming students. The results are recorded in the table below.

Number of hours spent in lab	Grade (percent)
10	96
11	51
16	62
9	58
7	89
15	81
16	46
10	51

A) –0.335 B) 0.462 C) 0.017 D) –0.284

Suppose you will perform a test to determine whether there is sufficient evidence to support a claim of a linear correlation between two variables. Find the critical values of r given the number of pairs of data n and the significance level α.

45) $n = 11$, $\alpha = 0.01$

A) $r = \pm 0.735$ B) $r = \pm 0.602$ C) $r = 0.765$ D) $r = 0.735$

46) $n = 17$, $\alpha = 0.05$

A) $r = \pm 0.482$ B) $r = \pm 0.606$ C) $r = 0.497$ D) $r = 0.482$

Use the given data to find the best predicted value of the response variable.

47) Six pairs of data yield $r = 0.444$ and the regression equation $\hat{y} = 5x + 2$. Also, $\bar{y} = 18.3$. What is the best predicted value of y for $x = 5$?

A) 18.3 B) 27 C) 4.22 D) 93.5

48) The regression equation relating dexterity scores (x) and productivity scores (y) for the employees of a company is $\hat{y} = 5.50 + 1.91x$. Ten pairs of data were used to obtain the equation. The same data yield $r = 0.986$ and $\bar{y} = 56.3$. What is the best predicted productivity score for a person whose dexterity score is 32?

A) 66.62 B) 56.30 C) 177.91 D) 58.20

49) Ten pairs of data yield $r = 0.003$ and the regression equation $\hat{y} = 2 + 3x$. Also, $\bar{y} = 5.0$. What is the best predicted value of y for $x = 2$?

A) 5.0 B) 8.0 C) 7.0 D) 17.0

Use the given data to find the equation of the regression line. Round the final values to three significant digits, if necessary.

50)

x	0	3	4	5	12
y	8	2	6	9	12

A) $\hat{y} = 4.88 + 0.525x$ B) $\hat{y} = 4.98 + 0.725x$ C) $\hat{y} = 4.98 + 0.425x$ D) $\hat{y} = 4.88 + 0.625x$

51)

x	3	5	7	15	16
y	8	11	7	14	20

A) $\hat{y} = 5.07 + 0.753x$ B) $\hat{y} = 4.07 + 0.753x$ C) $\hat{y} = 5.07 + 0.850x$ D) $\hat{y} = 4.07 + 0.850x$

52) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) when they entered the program were between 3.5 and 4.0. The following data were obtained regarding their GPAs on entering the program versus their current GPAs.

Entering GPA	Current GPA
3.5	3.6
3.8	3.7
3.6	3.9
3.6	3.6
3.5	3.9
3.9	3.8
4.0	3.7
3.9	3.9
3.5	3.8
3.7	4.0

A) $\hat{y} = 3.67 + 0.0313x$ B) $\hat{y} = 4.91 + 0.0212x$ C) $\hat{y} = 5.81 + 0.497x$ D) $\hat{y} = 2.51 + 0.329x$

1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) H_0: $p_1 = p_2$. H_1: $p_1 \neq p_2$.
Test statistic: z = 0.97. Critical values: z = ±1.96.
Fail to reject the null hypothesis. There is not sufficient evidence to warrant rejection of the claim that the recognition rates are the same in both states.
10) H_0: $p_1 = p_2$. H_1: $p_1 \neq p_2$.
Test statistic: z = 3.19. Critical values: z = ±2.575.
Reject the null hypothesis. There is sufficient evidence to warrant rejection of the claim that the proportion of smokers in the two age groups is the same.
11) H_0: $p_1 = p_2$. H_1: $p_1 < p_2$.
Test statistic: z = –2.41. Critical value: z = –1.28.
Reject the null hypothesis. There is sufficient evidence to support the claim that $p_1 < p_2$.
12) A
13) A
14) A
15) A
16) H_0: $\mu_1 = \mu_2$.
H_1: $\mu_1 < \mu_2$.
Test statistic: t = –1.477.
Critical value: –2.473.
Do not reject the null hypothesis. There is not sufficient evidence to support the claim that the treatment group is from a population with a smaller mean than the control group.
17) H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 < \mu_2$
Test statistic: t = –1.042
Critical value: t = –1.725
Do not reject H_0. At the 5% significance level, there is not sufficient evidence to support the claim that the mean salary of female employees is less than the mean salary of male employees.
18) H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 < \mu_2$
Test statistic: t = –2.365
0.005 < P–value < 0.01
Reject H_0. At the 1% significance level, there is sufficient evidence to support the claim that the mean systolic blood pressure of vegetarians is lower than the mean systolic blood pressure of nonvegetarians.
19) A
20) A
21) A
22) A

23) $H_0: \mu_1 = \mu_2$
$H_1: \mu_1 > \mu_2$
Test statistic: t = 0.881
Critical value: t = 2.056
Do not reject H_0. At the 2.5% significance level, there is not sufficient evidence to support the claim that the mean resting pulse rate of people who do not exercise regularly is greater than the mean resting pulse rate of people who exercise regularly.

24) $H_0: \mu_1 = \mu_2$
$H_1: \mu_1 < \mu_2$
Test statistic: t = –2.367
0.005 < P–value < 0.01
Reject H_0. At the 1% significance level, there is sufficient evidence to support the claim that the mean systolic blood pressure for vegetarians is lower than the mean systolic blood pressure for nonvegetarians.

25) A
26) A
27) A
28) A
29) A
30) A
31) A
32) A
33) A
34) A

35) $H_0: \mu_d = 0$. $H_1: \mu_d > 0$.
Test statistic t = 1.954. Critical value: t = 3.143.
Fail to reject H_0. There is not sufficient evidence to support the claim that the diet is effective in reducing weight.

36) $H_0: \mu_d = 0$. $H_1: \mu_d \neq 0$. Test statistic: t = –2.134. Critical values: t = 4.604, –4.604.
Fail to reject H_0. There is not sufficient evidence to support the claim that the tutoring has an effect.

37) $H_0: \sigma_1^2 = \sigma_2^2$ $H_1: \sigma_1^2 \neq \sigma_2^2$
Test statistic: F = 1.03.
Upper critical F value: 2.0693.
Fail to reject the null hypothesis. There is not sufficient evidence to support the claim that the samples come from populations with different variances.

38) $H_0: \sigma_1 = \sigma_2$ $H_1: \sigma_1 > \sigma_2$
Test statistic: F = 1.3.
Upper critical F value: 1.9938.
Fail to reject the null hypothesis. There is not sufficient evidence to support the claim that there is more variation in weights of men from town A than in weights of men from town B.

39) $H_0: \sigma_1 = \sigma_2$ $H_1: \sigma_1 > \sigma_2$
Test statistic: F = 6.47
Upper critical F value: 3.3881
Reject the null hypothesis. There is sufficient evidence to support the claim that the volumes of juice filled by the old machine vary more than the volumes of juice filled by the new machine.

40) A

41) A
42) A
43) A
44) A
45) A
46) A
47) A
48) A
49) A
50) A
51) A
52) A