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

1) Use the given sample data to test the claim that $p_1 > p_2$. Use a significance level of 0.01.   1) _____

Sample 1	Sample 2
$n_1 = 85$	$n_2 = 90$
$x_1 = 38$	$x_2 = 23$

2) A researcher finds that of 1000 people who said that they attend a religious service at least   2) _____
once a week, 31 stopped to help a person with car trouble. Of 1200 people interviewed who had not attended a religious service at least once a month, 22 stopped to help a person with car trouble. At the 0.05 significance level, test the claim that the two proportions are equal.

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.

3) Two types of flares are tested and their burning times (in minutes) are recorded. The   3) _____
summary statistics are given below.

Brand X	Brand Y
n = 35	n = 40
$\bar{x}$ = 19.4 min	$\bar{x}$ = 15.1 min
s = 1.4 min	s = 0.8 min

Use a 0.05 significance level to test the claim that the two samples are from populations with the same mean. Use the traditional method of hypothesis testing.

4) A researcher was interested in comparing the amount of time (in hours) spent watching   4) _____
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
$\bar{x}_1 = 12.1$ hr	$\bar{x}_2 = 14.2$ hr
$s_1 = 3.9$ hr	$s_2 = 5.2$ hr
$n_1 = 14$	$n_2 = 17$

Use a 0.05 significance level to test the claim that the mean amount of time spent watching television by women is smaller than the mean amount of time spent watching television by men. Use the traditional method of hypothesis testing.

5) 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

$n_1 = 101$	$n_2 = 105$
$\bar{x}_1 = 120.5$	$\bar{x}_2 = 149.3$
$s_1 = 17.4$	$s_2 = 30.2$

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

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.

7) Two types of flares are tested and their burning times are recorded. The summary statistics are given below.

Brand X   Brand Y

$n = 35$	$n = 40$
$\bar{x} = 19.4$ min	$\bar{x} = 15.1$ min
$s = 1.4$ min	$s = 0.8$ min

Construct a 95% confidence interval for the differences between the mean burning time of the brand X flare and the mean burning time of the brand Y flare.

A) 3.5 min $< \mu_X - \mu_Y <$ 5.1 min   B) 3.8 min $< \mu_X - \mu_Y <$ 4.8 min

C) 3.6 min $< \mu_X - \mu_Y <$ 5.0 min   D) 3.2 min $< \mu_X - \mu_Y <$ 5.4 min

8) Independent samples from two different populations yield the following data. $\bar{x}_1 = 677, \bar{x}_2 = 211$, $s_1 = 30, s_2 = 30$. The sample size is 245 for both samples. Find the 80% confidence interval for $\mu_1 - \mu_2$.

    A) $462 < \mu_1 - \mu_2 < 470$ B) $466 < \mu_1 - \mu_2 < 466$

    C) $463 < \mu_1 - \mu_2 < 469$ D) $460 < \mu_1 - \mu_2 < 472$

9) 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
$\bar{x}_1 = 12.8$ hrs	$\bar{x}_2 = 14.0$ 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) -5.71 hrs < $\mu_1 - \mu_2$ < 3.31 hrs   B) -5.84 hrs < $\mu_1 - \mu_2$ < 3.44 hrs

    C) -5.85 hrs < $\mu_1 - \mu_2$ < 3.45 hrs   D) -5.72 hrs < $\mu_1 - \mu_2$ < 3.32 hrs

10) A researcher was interested in comparing the heights of women in two different countries. Independent simple random samples of 9 women from country A and 9 women from country B yielded the following heights (in inches).

Country A	Country B
64.1	65.3
66.4	60.2
61.7	61.7
62.0	65.8
67.3	61.0
64.9	64.6
64.7	60.0
68.0	65.4
63.6	59.0

Construct a 90% confidence interval for $\mu_1 - \mu_2$, the difference between the mean height of women in country A and the mean height of women in country B.

(Note: $\bar{x}_1 = 64.744$ in., $\bar{x}_2 = 62.556$ in., $s_1 = 2.192$ in., $s_2 = 2.697$ in.)

    A) 0.17 in. < $\mu_1 - \mu_2$ < 4.21 in.   B) 0.14 in. < $\mu_1 - \mu_2$ < 4.24 in.

    C) 0.16 in. < $\mu_1 - \mu_2$ < 4.22 in.   D) 0.15 in. < $\mu_1 - \mu_2$ < 4.23 in.

1) $H_0: p_1 = p_2$. $H_1: p_1 > p_2$.
   Test statistic: z = 2.66.   Critical value: z = 2.33.
   Reject the null hypothesis. There is sufficient evidence to support the claim that $p_1 > p_2$.

2) $H_0: p_1 = p_2$. $H_1: p_1 \neq p_2$.
   Test statistic: z = 1.93.   Critical values: z = ±1.96.
   Fail to reject the null hypothesis. There is not sufficient evidence to warrant rejection of the claim that the two
   proportions are equal.

3) $H_0: \mu_1 = \mu_2$.
   $H_1: \mu_1 \neq \mu_2$.
   Test statistic t = 16.025.
   Critical values: t = ±2.032.
   Reject the null hypothesis. There is sufficient evidence to warrant rejection of the claim that the two samples are from
   populations with the same mean.

4) $H_0: \mu_1 = \mu_2$
   $H_1: \mu_1 < \mu_2$
   Test statistic: t = -1.283
   Critical value: t = -1.701
   Do not reject H_0. At the 5% significance level, there is not sufficient evidence to support the claim that the mean
   amount of time spent watching television by women is smaller than the mean amount of time spent watching
   television by men.

5) $H_0: \mu_1 = \mu_2$.
   $H_1: \mu_1 < \mu_2$.
   Test statistic: t = -8.426.
   Critical value: -2.364.
   Reject the null hypothesis. There is sufficient evidence to support the claim that the treatment group is from a
   population with a smaller mean than the control group.

6) $H_0: \mu_1 = \mu_2$
   $H_1: \mu_1 < \mu_2$
   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.

7) B
8) C
9) A
10) C