Panel 1

Test for Mean

1. $H_0: \mu = \mu_0$
2. $H_1: \mu \neq \mu_0$
3. $t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$
4. $p = 2 \cdot \Phi(-t)$

Test for Difference of Means

1. $H_0: \mu_1 = \mu_2$
2. $H_1: \mu_1 \neq \mu_2$
3. $t = \frac{\bar{x}_1 - \bar{x}_2}{s_p/\sqrt{n_1 + n_2}}$
4. $p = 2 \cdot \Phi(-t)$

Panel 2

Suppose you want to compare a new method of teaching reading to “slow learners” to the current standard method. You select a random sample of 22 slow learners; 10 of them are taught by the new method and 12 are taught by the standard method, for the same period of time. The reading scores for the two groups were as follows:

<table>
<thead>
<tr>
<th>New Method</th>
<th>Standard Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>80, 80, 79, 81, 76, 66, 71, 76, 70, 85</td>
<td>79, 62, 70, 68, 73, 76, 86, 73, 72, 68, 75, 66</td>
</tr>
</tbody>
</table>

a) What is the difference in average reading scores between the two methods?

b) Conduct a test to determine whether the new method is better than the standard method.

According to USA Today (Dec. 1999) the average age of MSNBC TV News viewers is 50 years. A company wants to market a product for this age group, but wants to ensure that the USA Today study is correct before investing advertisement money. They select 50 US households at random that view MSNBC TV News and find their average age to be 52.3 years with a standard deviation of 7.1 years. Should the company invest in advertising?

Panel 3

$H_0: \mu = 50$

Panel 4

Suppose you want to compare a new method of teaching reading to “slow learners” to the current standard method. You select a random sample of 22 slow learners; 10 of them are taught by the new method and 12 are taught by the standard method, for the same period of time. The reading scores for the two groups were as follows:

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a) What is the difference in average reading scores between the two methods?

b) Conduct a test to determine whether the new method is better than the standard method.
Panel 5

Question 3
1. The average weight of a box of chocolate is 270 g. You suspect that this is incorrect so you weigh a sample of 100 boxes to find that $\bar{x} = 2.35$ with $s = 6$. Is the claimed weight correct?

$H_0$:

$H_a$:

$\mu = \bar{x}$

$\mu \neq \bar{x}$

$p = 2(1 - \Phi(z)) = 0$

Panel 6

(2) To test a new blood pressure medication, one group of patients receive the new drug, the other a placebo. Their blood pressure is measured as follows:

Group A: 90, 90, 89, 92, 86 (with medication)

Group B: 110, 115, 97, 107, 120 (with placebo)

Is there a significant difference between the groups?

$H_0$:

$H_a$:

$t =$

$p =$

Panel 7

Dividing a Sample into Two Groups:

Example: The shared data set “ComputerUser2-norm.keep” shows temperature, sex, and heart beat of subjects. Check whether there is a significant difference in heart beat between men and women.

$\bar{x}_1 - \bar{x}_2 = 0$. Two samples $\sim$ normal.

Panel 8

Proportion

One experiment with 2 outcomes.

Denote $\hat{p}(s)$ =

$\Rightarrow \hat{p}(\hat{p}) =$

$H_0$: $H_a$: $t =$

$p = 2\Phi(\sqrt{n})$