

**Math 263****Quiz 6**

Name \_\_\_\_\_

Is there a link between chocolate and depression? In a study, 931 people who were not taking depression medication were screened for depression and filled out a food survey.<sup>1</sup> The participants were divided into two groups, 311 who screened positive for depression and 620 who screened negative for depression. These two subgroups were believed to be representative of the populations of depressed people not on medication and of non-depressed people. For the depressed group, the mean number of servings per month of chocolate was 8.39, with standard deviation 14.83. For the non-depressed group, the mean number of servings per month of chocolate was 5.39, with standard deviation 8.76.

(a) Is there evidence that people who are depressed eat more chocolate? Use the following steps to decide:

(i) What is the null hypothesis?

(ii) What is the alternate hypothesis?

(iii) Find the test statistic. (That is, the value of  $t$  or  $z$ .)

(iv) What is distribution of the test statistic? (Is it a  $t$  or  $z$ -score? If  $t$ , what is its degree of freedom?)

(v) Find the  $p$ -value.

(vi) What is your conclusion?

(b) What can you say about causation in this context?

Mark each of the statements as **T** (True) or **F** (False). The study provides evidence that:

\_\_\_ Chocolate and depression are associated.

\_\_\_ Chocolate causes depression.

\_\_\_ Depression causes people to eat chocolate.

\_\_\_ Chocolate may cause depression.

\_\_\_ Depression may cause people to eat chocolate.

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<sup>1</sup> "Mood food: chocolate and depressive symptoms in a cross-sectional analysis." Rose N et al. <http://www.ncbi.nlm.nih.gov/pubmed/20421555>. Reported in *Statistics: Learning from Data*, R. Peck Brooks-Cole 2014.