Math 21 – Pointers for Section 1.2

- **Response variable:** The outcome of a study, a variable you are trying to predict.
  Explanatory variable: A variable that explains or affects a response variable.
  The explanatory variable is considered to be an independent variable, and the response variable is considered to be a dependent variable because it depends on what happens with the explanatory variable.
- An **observational study** measures the value of the response variable without attempting to influence the value of either the response or explanatory variable.
  You basically stand back and *observe* what happens.
- A **designed experiment** is a study in which the researcher assigns the individuals in a study to a certain group, intentionally changes the value of an explanatory variable, and then records the value of the response variable for each group.
- **Confounding** occurs when the effects of two or more explanatory variables are not separated. Any relationship between an explanatory variable and the response variable may be due to other variable(s) not included in the study.
- A **lurking variable** is an explanatory variable not considered in the study, but affects the response variable.
- In a designed experiment, we can claim **causation**. In other words we can claim that changes in the explanatory variable cause the changes in the response variable.
  In an observational study, we can only claim that the explanatory variable and response variable are related. We cannot claim causation.
- A **census** is a list of all individuals in a population, along with certain characteristics of each individual.