

**TAKS Objective 1**  
**TEK A.1A**  
**Tutorial**  
**(Grades 9, 10, and 11)**

...describe independent and  
dependent quantities in functional  
relationships

$y = mx + b$   
is a linear relationship.

"y" is the dependent quantity or variable.

"x" is the independent quantity or  
variable.

"m" and "b" are slope and y-intercept and are not  
considered dependent or independent.

Equations written in a similar form possess the same relationship.

The variable by itself is known as the dependent quantity or variable.

The variables not by themselves are known as the independent quantities or variables.

Variables represent unknown quantities, not given numbers.

So, when the question asks about the dependent or independent quantity, it is asking about the independent or dependent variable and not given numbers.

## Example

$$C = 2\pi r$$

Which quantity is independent?

The independent quantity is "r" since quantity implies "variable" in this instance.

## Example

$$C = 15h + 10$$

Which quantity is dependent?

The dependent quantity is "C" since quantity implies "variable" in this instance and the dependent variable is by itself.

## Example

$$S = 2\pi rh + 2\pi r^2$$

Identify any independent quantities.

The dependent quantity is "S" since "S" is by itself. Therefore, the independent quantities are "r" and "h".

Sometimes, a verbal situation will be given and you will be asked to determine the independent or dependent quantity.

To determine which unknown is which, you must first determine which unknown would occur first in the situation.

The unknown quantity that would occur first is the "independent" quantity.

The unknown quantity that would occur as a result is the "dependent" quantity.

## Example

A coat vendor made a table showing the relationship between the monthly low temperature and the number of coats sold each month.

What is the dependent quantity in this relationship?

the number of coats sold each month

## Example

An automobile dealer is comparing the miles per gallon that different models get and the yearly sales of each of those models.

What is the independent quantity in this relationship?

miles per gallon