

Complete this worksheet after studying Chapter 1 in your text and before you begin studying Chapter 2. Mail this completed worksheet together with the completed Worksheets 2 and 4 as Assignment 5.1 to the address in the Step-By-Step Instructions.

1. For each of the following descriptions of a relation between two variables, decide if either or both variables is a function of the other. Explain your answer briefly in each case:

a) The variable x is the depth of water in feet in a spherical tank of radius 5 feet and y is the volume of water in the tank.

Is y a function of x ? Yes ____; No ____ . Explain briefly:

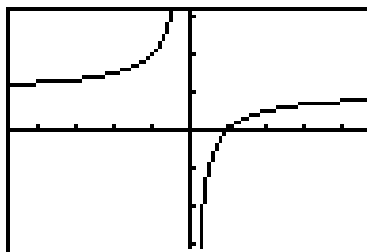
Is x a function of y ? Yes ____; No ____ . Explain briefly:

b) The variable x is the weight in ounces of an envelope that can be mailed currently in the USA with y cents of postage.

Is y a function of x ? Yes ____; No ____ . Explain briefly:

Is x a function of y ? Yes ____; No ____ . Explain briefly:

c) The graph of the relation between x and y is given in the calculator screen shot below: (The horizontal line is the x -axis and the vertical line is the y -axis.)



Answer the questions on the following page about this graph:

Is y a function of x ? Yes ____; No ____ . Explain briefly:

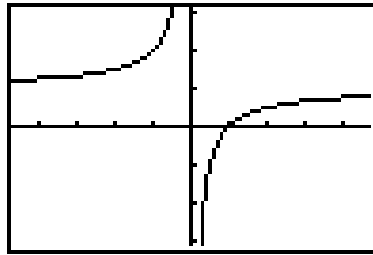
Is x a function of y ? Yes ____; No ____ . Explain briefly:

d) For each of the relations in parts a) through c) above, determine those for which y is an increasing function of x on its domain. Provide a brief reason for your answers:

i) x is the depth of water in feet in a spherical tank of radius 5 feet and y is the volume of water in the tank. Check here if y is an increasing function of x . Explain briefly:

ii) x is the weight in ounces of an envelope that can be mailed currently in the USA with y cents of postage. Check here if y is an increasing function of x . Explain briefly:

iii) The graph of the relation between x and y given in the calculator screen shot below:



Check here if y is an increasing function of x . Explain briefly:

3. (Calculator Skills) Use your calculator to graph the function

$$y_1(x) = x^3 - 3x^2 - x + 3 \text{ on the window } -4.7 \leq x \leq 4.7; -3.1 \leq y \leq 3.1.$$

a) Describe a way to graph functions in this window without entering the window endpoints with the WINDOW button of your calculator.

b) Use the ZOOM and TRACE buttons of your calculator to find the following values for the graph accurate to three decimal places:

i) x-intercepts:

ii) y-intercepts:

iii) the endpoints of the interval on which the function is decreasing:

iv) the values of x for which the y-value is equal to 1.5:

c)) Use the ZOOM and TRACE buttons of your calculator to find the (x, y) – coordinates of the middle point of intersection of the graph of $y_1(x)$ and $y_2(x) = 1.5(1.15)^x$ accurate to three decimal places: