Discussion Assignment 1

Does this equation determine a relation between x and y?

Yes, the equation $x^2 + (y-2)^2 = 1$ determine a relation between x and y. By referring to the equation of a circle, the center of the circle is (0,2) and the radius is equal to 1. The distance between $(0,2)$ and the points (x, y) found on the circumference will be 1, which reveals a geometric relation between the variables.

Can the variable x can be seen as a function of y, like x=g(y)?

When using the vertical line test to identify functions, the line will cut through two corresponding x-values on both sides of the circle for every value of y within the domain of the circle, which is (1,3). Therefore, the variable x cannot be expressed as a function of y because it will dispute the vertical line test for functions.

Can the variable y be expressed as a function of x, like y= h(x)?

Similarly, when using the horizontal line test to identify functions, the line will cut through two corresponding x-values on both sides of the circle for every value of x within the domain of the circle, which is $(-1,1)$. Therefore, the variable y cannot be expressed as a function of x because it also disputes the horizontal line test for functions.

If these are possible, then what will be the domains for these two functions?

Since multiple values y-values and x-values can be found for $x = g(y)$ and $y = h(x)$ respectively, none of the functions have specific domains.

What are the graphs of these two functions?

None of the functions do not satisfy the criteria for functions due to their multiple y-values and x-values for $x = g(y)$ and $y = h(x)$ respectively, which form a circle as determine by the given equation. For that reason, both functions can hardly be drawn in the conventional Cartesian coordinate system.

Are there points of the coordinate axes that relate to (0, 2) by means of R?

The equation given represents that of a circle with center (0, 2) and radius 1. Since the relation "(x, y) R (0, 2)" means that the point (x, y) is on this circle, it can be concluded that there are points on the coordinate axes can be related to (0, 2) through the relation R.