

Problems on Functions, Inequalities & Statistics.

1) A function $f(x)$ is defined as follows:

$$\frac{1}{f(x)} = 1 + \frac{x}{f(x)}$$

Note: Definition of a function is that for a given input parameters of the function, there is only one value of the function. In the above example, for one value of x , there is only one value of $f(x)$.

a) For a unit increase in value of x , how does the value of $f(x)$ change? In other words if x increases by '1', how does $f(x)$ change? Prove it.

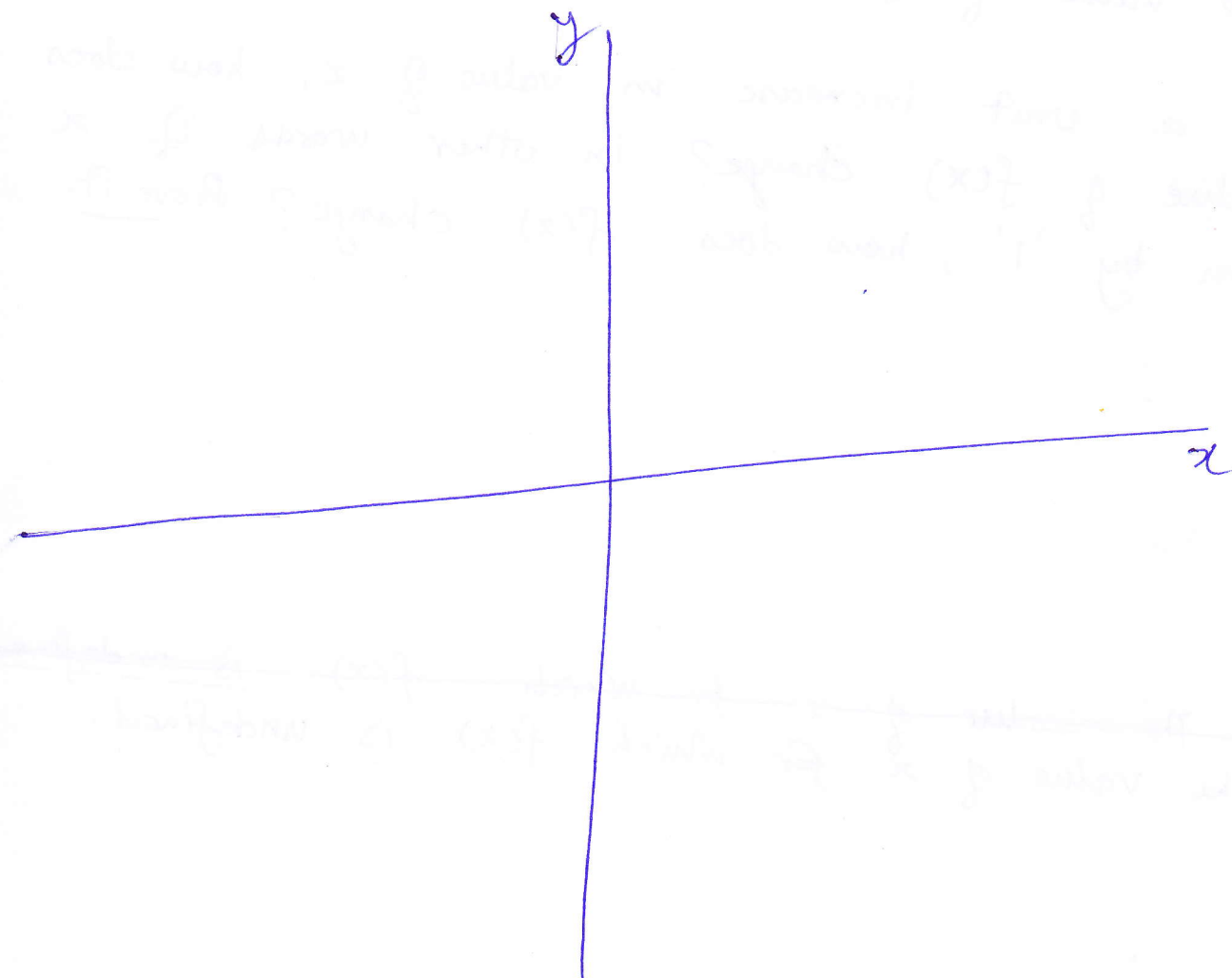
~~(b) Find the value of x for which $f(x)$ is undefined.~~
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2) There is a crazy function of two variables.
called $f(x,y)$.

The definition of this function is as follows

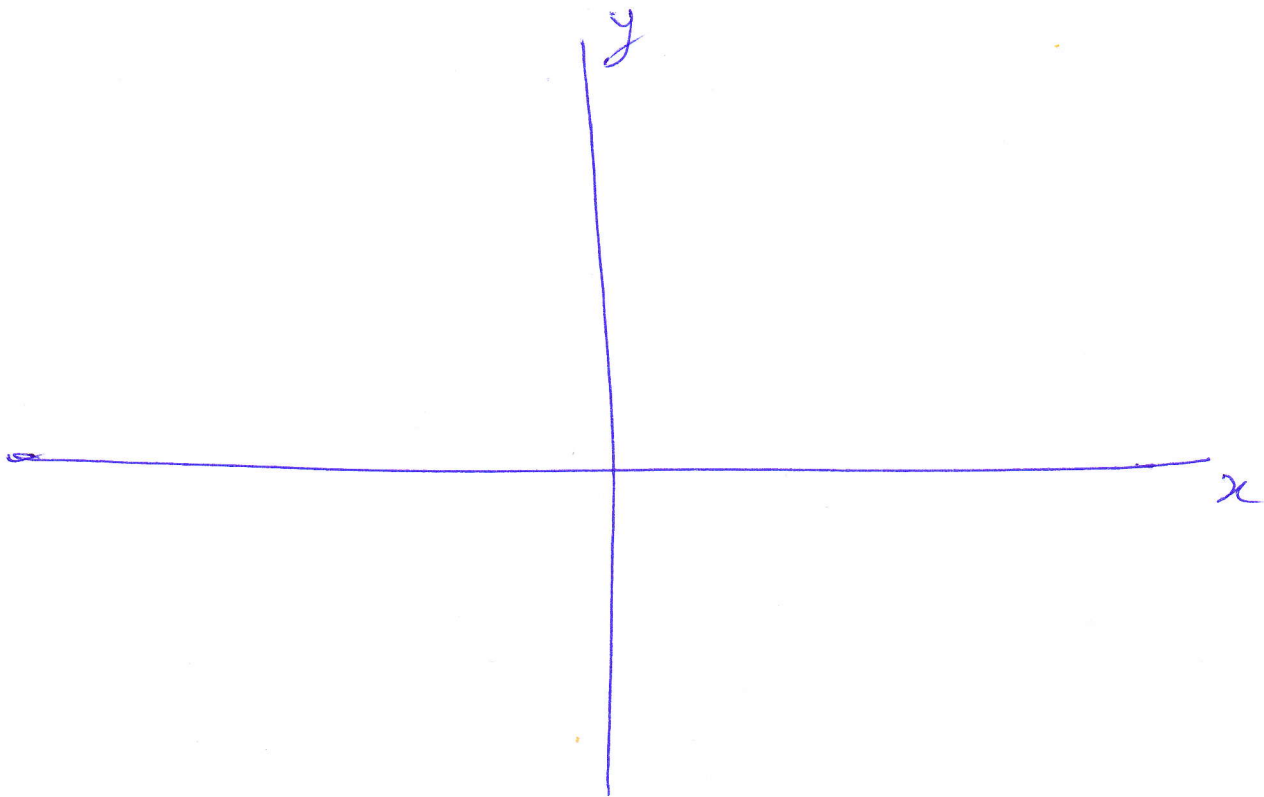
$$f(x,y) = x^2 - y^2$$

On the following graph, show values of x & y
such that $f(x,y) = 0$. (Draw the graph)



3) On the following graph, show the feasible region for the following inequality

$$|x-y| \leq x^2 - y^2$$



4) If average of two numbers is 7 and the product of these same two numbers is $\sqrt{1600}$, then find the average of squares of the same two numbers.

Show your algebra work.

Guess work is not allowed.

5) Find all possible values of a and b such that average of a & b is greater than the difference between a and b .

Q. If the average of x and y is equal to 30% of x and is also equal to 10 more than 40% of y , then find the values of x and y .