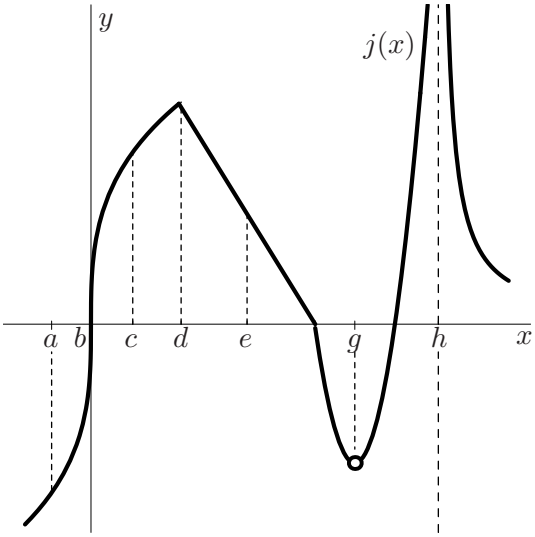
3. (6 points) Write the **limit definition** for the derivative of $\log(x^2+2)$ with respect to x. (There is no need to simplify or to attempt to find the limit.)

4. (9 points) Consider the function $y = j(x)$ graphed below.



Fill in the blanks with all the labelled x values (if any) on the graph satisfying each of the specified conditions. If there are no values which satisfy the condition, write "none."

- The function j is discontinuous here: _____
- The function j is not differentiable here: _____
- The function j' is zero here: _____
- The function j' is negative here: _____
- The function j'' is positive here: _____