

Problem statement Suppose $f(x) = |x - |x - 3||$. $f(x)$ is defined for all real numbers.

a) Find the graph of $y = f(x)$ in the window $-5 \leq x \leq 5$ and $0 \leq y \leq 10$.

b) Give a piecewise definition (on all of its domain) of $f(x)$ *without* using absolute value. The graph may help to answer this question, but justify your answer algebraically with a case-by-case argument from the equation for y . Your justification could begin with a statement such as, “When $x \geq 3$, then y is given by the formula ... because ...”.