1. Questions (a)-(e) below all concern the function

\[ f(x) = \frac{1}{2x}. \]

(a) [4 points] Use the definition of the derivative (and not any other method) to find \( f'(2) \).

(b) [4 points] Use derivative rule(s) to find \( f'(2) \).
(c) [3 points] Find the equation of the tangent line to the graph of $f(x)$ at $x = 2$.

(d) [2 points] Which option describes the graph of $f$ correctly? Give reasons for your choice.
   i. Always increasing
   ii. Always decreasing
   iii. Increasing on $(0, \infty)$ and decreasing on $(-\infty, 0)$
   iv. Decreasing on $(0, \infty)$ and increasing on $(-\infty, 0)$

(e) [Bonus] [2 points] Sketch a rough graph of $f$ and its tangent line at $x = 2$. 