1. Follow the steps below to find the tangent line to the function $f(x)=1 / x$ at $x=2$.
(a) The first step is compute the slope of the line that passes through the points $(x, f(x))$ and $(2, f(2))$.

$$
\frac{f(x)-f(2)}{x-2}
$$

Write out this expression for $f(x)=1 / x$.
(b) The slope of the tangent line is

$$
\lim _{x \rightarrow 2} \frac{f(x)-f(2)}{x-2}
$$

Can we apply the rule for the limit of a quotient to find this limit?
Can we use direct substitution to find the limit?
If these rules do not apply, does the mean the limit does not exist?
(c) Simplify the expression

$$
\frac{f(x)-f(2)}{x-2} .
$$

(d) Find the slope of the tangent line.
(e) Find the equation of the tangent line to the graph of $y=1 / x$ at $x=2$.

