9. (a) (4 points) Suppose that the tangent line to the function $y = f(x)$ at $x = c$ passes through the origin. Express $\left.\dfrac{dy}{dx}\right|_{x=c}$ in terms of c and $f(c)$.

(b) (6 points) Consider the graph of $xy = ae^{by}$, where both a and b are positive (non-zero) constants. Determine $\dfrac{dy}{dx}$.

(c) (6 points) Write down the equations of all lines passing through the origin which are tangent to the curve $xy = ae^{by}$, where as before a and b are positive (nonzero) constants. [*Hint: You may find it helpful to rewrite your answer to 9b without exponentials, by using substitution – by the definition of the curve, you can replace the quantity ae^{by} by xy.*]