**Separable Differential Equation problem with linear approximation**
*AP Calculus*

Do this free response question on a separate piece of paper and practice showing clear work. Be sure to show each step of how you solved part (b). In part (a), be sure to clearly write the equation of the tangent line and then communicate that you're finding an approximate value for *f(1.2)* i.e. write $f(1.2) \approx$ *your answer*

Consider the differential equation $\frac{dy}{dx} = e^y\left(3x^2 - 6x\right)$. Let $y = f(x)$ be the particular solution to the differential equation that passes through $(1, 0)$.

(a) Write an equation for the line tangent to the graph of $f$ at the point $(1, 0)$. Use the tangent line to approximate $f(1.2)$.

(b) Find $y = f(x)$, the particular solution to the differential equation that passes through $(1, 0)$.