7.(12 points)

(a) Find $\frac{dy}{dx}$ given the equation $y^3 - xy = 2$.

(b) Is there a point, (x_0, y_0), where the tangent to the curve is horizontal (i.e., parallel to the x-axis)? If so, find one. If not, explain why not.

(c) Show that the point (3,2) lies on the curve, and find the equation of the tangent line to the curve at (3,2).

(d) Use local linearization to find a good approximation for a value of y when the point $(3.09, y)$ lies on the curve. [Show your work.]