Class Drill 8: Questions about Tangent Lines

Let \( f(x) = x^3 - 3x^2 - 9x + 11 \)

(a) Find \( f'(x) \).
Use the techniques of Section 2.5. (That is, DO NOT use the Definition of the Derivative.)
Show all details clearly and use correct notation.

(b) Find the slope of the line that is tangent to the graph of \( f \) at \( x = 3 \).

(c) Find the slope of the line that is tangent to the graph of \( f \) at \( x = 0 \).

(d) Find the \( x \)-coordinates of all points on the graph of \( f \) that have horizontal tangent lines.
(e) Find the equation of the line that is tangent to the graph of \( f \) at \( x = 2 \). Show all details clearly and present your equation in slope intercept form.

(Remember that the approach is to build the general form of the equation for the tangent line in point-slope form

\[
(y - f(a)) = f'(a) \cdot (x - a)
\]

and then convert the equation to slope-intercept form.)