

Name: _____
AP Calculus: Higher Derivatives Homework

Date: _____
Ms. Loughran

1. Find an equation of the tangent line to the graph of $y = f(x)$ at the point where $x = -3$ if $f(-3) = 2$ and $f'(-3) = 5$.

2. Find $\frac{d^2y}{dx^2}$

(a) $y = 7x^3 - 5x^2 + x$

(b) $y = 12x^2 - 2x + 3$

3. Find y''' .

(a) $y = x^{-5} + x^5$

(b) $y = \frac{1}{x}$

(c) $y = ax^3 + bx + c$ (a, b and c are constants)

4. Find (a) $f'''(2)$ where $f(x) = 3x^2 - 2$

(b) $\left. \frac{d^4y}{dx^4} \right|_{x=1}$, where $y = \frac{1}{x^3}$

5. Show that $y = x^3 + 3x + 1$ satisfies $y''' + xy'' - 2y' = 0$.

6. Given that $f(-2) = 3$ and $f'(-2) = 5$, find an equation for the tangent line to the graph of $y = f(x)$ at the point where $x = -2$.