Intermediate Microeconomics 301
Mathematical problems

1. Find the first and second derivatives of
   
   (a) $ax^4 + bx^3 + cx + d$
   (b) $(ax + b)(cx^2)$
   (c) $ax + b$
   (d) $ax^b$
   (e) $\log ax$

2. Solve the following optimization program

   $\max_x (5x^1 - 3x + 2)$

3. Given the function $y = 4x^2 + 9$,
   
   • find the derivative $\frac{dy}{dx}$.
   • Find $f'(3)$ and $f'(4)$.

4. Given the function $y = 5x^2 - 4x$,
   
   • find the derivative $\frac{dy}{dx}$.
   • Find $f'(2)$ and $f'(3)$.

5. Find the derivative of $7x^4 + 2x^3 - 3x + 37$.

6. Find the derivative of $(2x + 3)(3x^2)$

7. Find the derivative of $\frac{2x-3}{x+1}$.

8. Find the derivative of $\frac{5x}{x^2+1}$

9. Find the derivative of $\frac{ax^2 + b}{cx}$