

Calculus I, Gradescope Assignment, Week 5

- Q1. Find an expression for $\frac{dy}{dx}$ in terms of x and y given the relation $2y^{3/2} + xy - x = 0$. 2 marks
- Q2. Given that y is a differentiable function of x and satisfies the equation, $x^3 - 2y^2 + xy = 0$, calculate y' at the point $(x, y) = (1, 1)$. 3 marks
- Q3. Find all local maxima and minima, and hence the global extreme values, of $f(x) = x^4 - 2x^2 + 1$ in the interval $[-2, 2]$. 7 marks
- Q4. Find the global extreme values of $f(x) = x|x^2 - 6| - \frac{3}{2}x^2 + 2$ in $[-2, 4]$. 10 marks
- Q5. Either find the global maximum or justify that it does not exist for $f(x) = x^4 - 2x^2$ in $[-\frac{1}{3}, \frac{4}{3}]$, 6 marks
- Q6. Either find the global maximum or justify that it does not exist for $f(x) = x^4 - 2x^2$ in $[-\frac{1}{3}, 2]$. 2 marks
- Q7. Either find the global maximum or justify that it does not exist for $f(x) = x^4 - 2x^2$ in $(0, 1]$. 4 marks