Problem Set 3-Monday

Please indicate the members who are present. Also indicate the group coordinator.

Group Number:	
Members:	

Problem 1

If $y = \displaystyle\int_{\sqrt[3]{x}}^{0} \sin(t^3)dt$. Find $\dfrac{dy}{dx}$.

Problem 2

Evaluate the integral

$$\int_0^4 2^x dx$$

Problem 3

Let $\displaystyle\int_0^{x^2} \frac{2f\left(\sqrt{t}\right)}{t^2}\,dt = x^2 - 1$. If $x > 0$, find $f'(2)$

Problem 4

If $G(u) = \int_1^u g(x)dx$ where $g(x) = \int_1^{x^2} \frac{\sqrt{9+t^2}}{t}dt$. Find $G''(2)$.

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Problem (Challenge)

Show that

$$0 \le \int_5^{10} \frac{x}{x^4 + x^2 + 1} \le 0.6$$

(Hint: compare the integrand to a simpler function.)