Work quickly and carefully, following directions closely. Answer all questions completely.

FOR ALL PROBLEMS: Define \( P, Q, R, \) and \( S \) to be the four digits in your given number.

\[
P = \_, \quad Q = \_, \quad R = \_, \quad S = \_.
\]

§I. PROBLEMS. You must show your work to receive credit. There are 5 problems at 5 points each.

1. Define \( f(x) = Px^3 + Qx^2 + Rx + S. \) Evaluate \( f'''(0). \)

\[
f(x) = \]

\[
f'''(0) =
\]

2. If the derivative is \( g'(a) = \lim_{h \to 0} \frac{P(a + h)^3 - Q(a + h) + 1 - Pa^3 - Qa + 1}{h}, \) then what is the function \( g(x)? \)

\[
g(x) =
\]

3. Let \( y = \left( \frac{Px - Q}{x} \right)^2. \) Then calculate \( y'. \)

\[
y =
\]

\[
y' =
\]

Go on to the back page.
FOR ALL PROBLEMS: Define $P, Q, R,$ and $S$ to be the four digits in your given number.

$P = \underline{\hspace{2cm}}, \quad Q = \underline{\hspace{2cm}}, \quad R = \underline{\hspace{2cm}}, \quad S = \underline{\hspace{2cm}}.$

4. Set $\clubsuit = S + 1 = \underline{\hspace{2cm}}$ and $y = \sqrt[3]{z}.$ Does $\frac{dy}{dz}$ exist at $z = 0$? Justify your answer.

5. If $R$ is even, set $b = 3$; if $R$ is odd, set $b = 4$. Then $b = \underline{\hspace{2cm}}$.

Find the antiderivative $\int b^x \, dx$.

EC. Who or what is Misshepezhieu?