(15pts) NAME (printed neatly):  

(10pts) Section Number (circle correct section):  
504 (12:40pm)  
505 (9:10am)  
506 (11:30am)  

Quiz Grade: ____________

Directions for taking quizzes: You may not share calculators. Follow the Aggie Honor Code! Give calculator commands where appropriate.

1. Given \( f(x) = \sqrt[3]{16 - x^2} \). You must use calculus to find the answers to the questions (do not use the graph on your graphing calculator to find these answers, unless told otherwise). All numbers need to be exact.

   a. (5 pts) In interval notation, what is the domain of \( f(x) = \sqrt[3]{16 - x^2} \)?
   \[
   (-\infty, \infty)
   \]

b. (15 pts) Find and simplify \( f''(x) \).
   \[
   f(x) = \left(16 - x^2\right)^{\frac{2}{3}}
   
   f'(x) = \frac{1}{3} \left(16 - x^2\right)^{-\frac{1}{3}} (-2x)
   
   = \frac{-2x}{3 \left(16 - x^2\right)^{-\frac{1}{3}}}
   
   \begin{align*}
   &\text{or} \quad -\frac{2x}{3} \left(16 - x^2\right)^{-\frac{2}{3}} \\
   &\text{or} \quad \frac{-2x}{\sqrt[3]{3} \left(16 - x^2\right)^{\frac{2}{3}}} \\
   &\text{or} \quad \frac{-2x}{\sqrt[3]{3} \left[\left(4 + x\right)\left(4 - x\right)\right]^{\frac{2}{3}}}
   \end{align*}
   
   c. (9 pts) What are all the critical numbers of \( f(x) = \sqrt[3]{16 - x^2} \)?
   \[-4, 0, 4\]

d. (5 pts) Look at the graph of \( f(x) = \sqrt[3]{16 - x^2} \) on your calculator. As point(s), give all local minimums of \( f \). If none, write "NONE."
   \[
   \text{NONE}
   \]
e. (26 pts) On the interval \([-5, 6]\), find the absolute minimum value and absolute maximum value of 
\[ f(x) = \sqrt[3]{16 - x^2} \].

\[
\begin{align*}
f(-5) &= \sqrt[3]{16 - 25} = \sqrt[3]{-9} \\
f(-4) &= 0 \\
f(0) &= \sqrt[3]{16 - 0} = \sqrt[3]{16} \\
f(4) &= 0 \\
f(6) &= \sqrt[3]{16 - 36} = \sqrt[3]{20}
\end{align*}
\]

The exact absolute minimum value on \([-5, 6]\) is \(\sqrt[3]{20} \approx -2.0472\) or \(-2.0472\) to \(\frac{4}{3}\) of \(\frac{1}{3}\).

The exact absolute maximum value on \([-5, 6]\) is \(\sqrt[3]{16} \approx 2.5198\) or \(2.5198\) to \(\frac{4}{3}\) of \(\frac{1}{3}\).

2. (15 pts). Any reasonable answer will receive full credit for this question. What do you think would be a good name for a **Pre-Calculus newsletter** that would be geared toward TAMU pre-calculus students?

NAME: ____________________________

MATH 131 SECTION (Circle one):

504 505 506

Circle First Letter of Last Name:

A-D  E-K  L-R  S-Z