6. [12 points] In the following problems, support all your answers by stating the test(s) or facts you used to prove convergence or divergence. Show all your work.

a. [4 points] \( \sum_{n=1}^{\infty} \frac{\sqrt{n}}{1+n^3} \) Circle your answer: Converges Diverges

b. [4 points] \( \sum_{n=1}^{\infty} \frac{1}{2 + \cos^2(n)} \) Circle your answer: Converges Diverges

c. [4 points] For which values of \( a \) does the series

\[
\sum_{n=1}^{\infty} \frac{a^n}{3^n} = \frac{a}{3} + \frac{a^2}{9} + \frac{a^3}{27} + \cdots
\]

converge? For the values of \( a \) where the series converges, find the sum of the series.