4. [8 points] Let $f(x) = \sqrt[3]{1+2x^2}$.

a. [5 points] Find the first 3 nonzero terms of the Taylor series for f centered at $x = 0$.

b. [3 points] For what values of x does the Taylor series converge?

5. [3 points] Determine the **exact** value of the infinite series

$$-1 + \frac{1}{3!} - \frac{1}{5!} + \cdots + \frac{(-1)^{n+1}}{(2n+1)!} + \ldots$$

No decimal approximations are allowed. You **do not** need to show your work.