Directions: Answer each question. Simplify.

1.) Determine if the sequence converges or diverges. If it converges, then find the limit. (2 pts)

\[ a_n = \frac{\sin(4n)}{5 + \sqrt{n}} \]

\[ \lim_{n \to \infty} a_n = 0 \]

2.) Determine whether the series is convergent or divergent. If it is convergent, then find its sum. Make sure you mention any tests that you use. (3 pts)

\[ 2 - 3 + \frac{9}{2} - \frac{27}{4} + \cdots \]

Divergent