

1- Determine whether the sequence converges or diverges. If it converges, find the limit.

(a) $\{\ln(2n^2 - 1) - \ln(2n^2 + 1)\}$

(b) $a_n = n \sin\left(\frac{1}{n}\right)$

2- Determine whether the series is convergent or divergent. If it is convergent, find its sum if possible:

(a) $\sum_{n=1}^{\infty} \frac{3n^2 + 2n}{2n^2 + 1}$

(b) $\sum_{n=1}^{\infty} \frac{2^{n-1} + 3^n}{5^n}$

$$(c) \sum_{n=3}^{\infty} \frac{3n - 4}{n^2 - 2n}$$



3- If the curve $y = \sqrt[3]{x}$, $1 \leq y \leq 2$ is rotated about the y -axis, then what is the area of the resulted shape?