

1. Find the area of the region bounded by the curves

$$y = \frac{1}{1+x^2}$$
$$y = \frac{\sqrt{3}}{4x}$$

Suggestion: Graph the curves first.

2. Evaluate

$$\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \left(\frac{k}{n}\right)^p$$

when $p > 0$. (Your answer will be in terms of p .)

3. Show that the volume of a pyramid with a square base that is $s \times s$ having height h is $s^2h/3$.
4. Find the average value of $f(x) = \sin^2(x)$ on the interval $[0, \pi/4]$.