$\lim_{n\to\infty} \frac{1}{n} \sum_{i=1}^{n} \frac{8}{1+(i/n)^2} = \lim_{n\to\infty} \sum_{i=1}^{n} \frac{8}{1+(i/n)^2} \cdot \frac{1}{n} = \lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\,\Delta x$, where $\Delta x = (1-0)/n = 1/n$, $x_i = 0 + i\,\Delta x = i/n$, and $f(x) = \frac{8}{1+x^2}$. Thus, the definite integral is $\int_0^1 \frac{8dx}{1+x^2}$.