2. [13 points] Let \( f(x) = \frac{1}{2x^2 + 1} \).

a. [4 points] Approximate the integral \( \int_{1}^{5} f(x) \, dx \) using MID(2). Write out each term in your sum. You do not need to simplify the numbers in your sum, but your final answer should not contain the letter “\( f \)”. 

b. [4 points] Approximate the integral \( \int_{1}^{5} f(x) \, dx \) using TRAP(2). You do not need to simplify the numbers in your sum, but your final answer should not contain the letter “\( f \)”. 

c. [5 points] Compute the exact value for \( \int_{1}^{5} f(x) \, dx \). Show all your steps. You do not need to simplify the numbers in your final answer.