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Both Trapezoid Rule and Simpson’s Rule give numerical approximations for definite integrals, using a certain number of sections and approximating the

Trapezoid Rule – This method uses the two endpoints of the subinterval. Using those endpoints this rule approximates the area under the curve by approximating it to be trapezoidal and then finding the area of said trapezoid to get the area. This rule does it for each subsection, and sums all of the areas to get the total approximate area under the curve, representing the integral solution.

Simpson’s Rule – This is similar to the Trapezoid Rule, but does not stating the area under the integrand is approximately trapezoidal. It instead takes the two endpoints and the point between the two endpoints, and fits a polynomial function to the three points. Then, it finds the area under the approximated function. This is useful because it doesn’t assume that between two points in a subsection, the function is straight. Instead, the polynomial is curved so it can adjust to integrands that vary within the sub interval, for example having concavity.