M1B/Schoenbrun Section 5.9 Approximate Integration

Part 1)
For each integral calculate the exact value using an anti-derivative, or use a calculator.
Then for each integral / N option, fill in the left-point, right-point, mid-point and trapezoidal rule estimate.

Note the N's are the number of data points, so the number of intervals is N-1.

| Integral | Exact | N | Left | Right | Mid | Trap | Simpson |
|---|---|---|---|---|---|---|---|
| $\int_0^1 \frac{1}{1+x^2}\,dx$ | | 5 | | | | | |
| $\int_0^1 \frac{1}{1+x^2}\,dx$ | | 11 | | | | | |
| $\int_0^{\pi} \frac{\sin x}{1+x}$ | | 5 | | | | | |

Check the relative accuracy of each estimate.

Part 2) Fill in estimate using Simpson's rule, and compare it with the other estimates.