

Practice with FTC2

1. For each of the following,

- Find “easy to compute” lower and upper bounds for the value of the given definite integral.
- Use the Second Fundamental Theorem of Calculus, if applicable, to evaluate the given definite integral.
- Check that your result is consistent with your bounds.

(a) $\int_1^5 x^4 dx$

(b) $\int_{-2}^3 (1 - x^2) dx$

(c) $\int_0^\pi \sin x dx$

(d) $\int_0^1 \frac{1}{1+x^2} dx$

(e) $\int_{-1}^1 \frac{1}{x^2} dx$

2. Water flows into a tank at a flow rate (in gallons per hour) given by $f(t) = 5 + \sin(\pi t)$ for $t = 1$ to $t = 4$ hour. Determine the amount of water that accumulates in the tank during this three-hour interval.