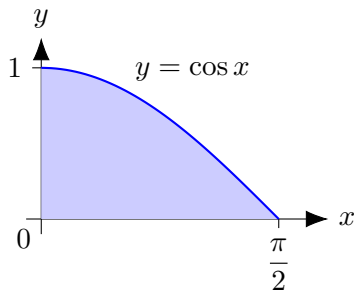


5.4 FTC Part 2, Indefinite Integrals (Activity)

1. Evaluate $\int_1^3 e^x dx$

2. Find the area under the cosine curve from 0 to $\pi/2$.



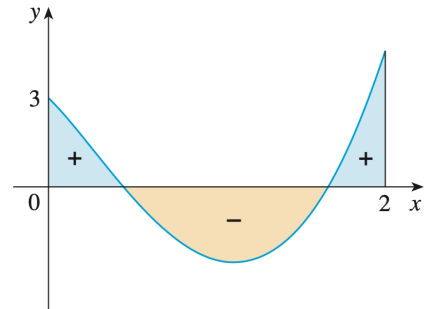
3. What is wrong with the following calculation?

$$\int_{-1}^3 \frac{1}{x^2} dx = \left[\frac{x^{-1}}{-1} \right]_{-1}^3 = -\frac{1}{3} - 1 = -\frac{4}{3}.$$

4. Find the indefinite integral $\int (10x^4 - 2 \sec^2 x) dx$.

5. Evaluate $\int_0^3 (x^3 - 6x) dx$.

6. Find $\int_0^2 \left(2x^3 - 6x + \frac{3}{x^2 + 1} \right) dx$ and interpret the result in terms of areas.



7. Evaluate $\int_1^9 \frac{2t^2 + t^2\sqrt{t} - 1}{t^2} dt$.

Theorem. The integral of a rate of change is the net change:

$$\int_a^b F'(x) dx = F(b) - F(a)$$

8. A particle moves along a line so that its velocity (m/s) at time t is $v(t) = t^2 - t - 6$.
- Find the displacement of the particle during the time period $1 \leq t \leq 4$.
 - Find the distance traveled during this time period.