

1. (2 points) Evaluate the definite integral.

$$\int_{-2}^{-1} x\sqrt{x+2} dx$$

(a) $-\frac{14}{15}$

(b) $\frac{14}{15}$

(c) $-\frac{2}{5}$

(d) $-\frac{4}{3}$

(e) $\frac{32}{15}$

2. (2 points) Determine whether the improper integral converges or diverges. If it converges, find its value.

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

(a) It converges to 0.

(b) It converges to $\frac{1}{2}$.

(c) It converges to 1.

(d) It diverges.

(e) There is not enough information to decide.

3. (2 points) Let R be the region between $y = f(x)$ and $y = g(x)$ on $0 \leq x \leq 2$, where

$$f(x) = 2x + 1, \quad g(x) = x^2.$$

A solid has base R , and cross-sections perpendicular to the x -axis are squares. Which definite integral represents the volume of the solid?

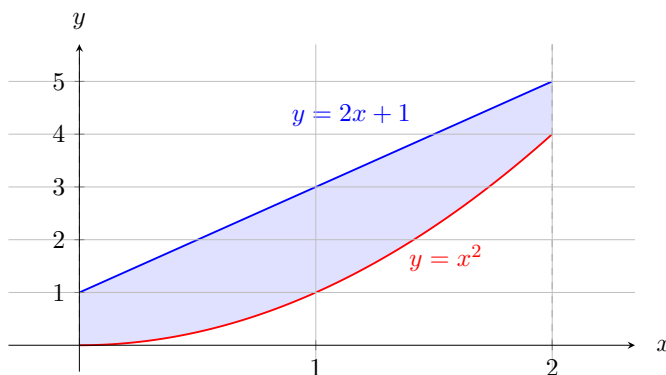
(a) $\int_0^2 [(2x + 1) - x^2]^2 dx$

(b) $\int_0^2 [(2x + 1) - x^2] dx$

(c) $\int_0^2 [(2x + 1)^2 - (x^2)^2] dx$

(d) $\int_0^2 \pi [(2x + 1) - x^2]^2 dx$

(e) $\int_2^0 [(2x + 1) - x^2]^2 dx$



4. (4 points) Solve the following initial value problem:

$$\frac{dy}{dx} = \frac{\cos x}{y}, \quad y(0) = 3.$$