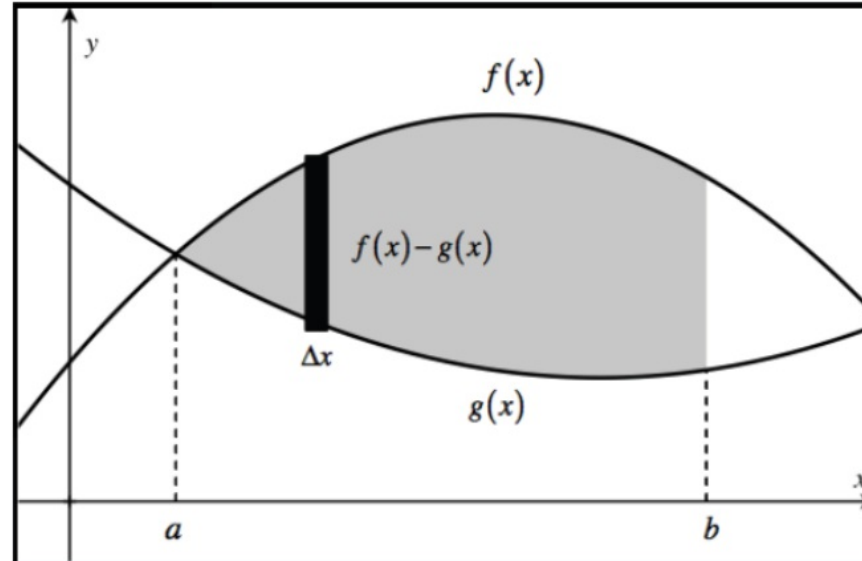


Unit 5: Applications of Integration

5.1 Area of Region Between Two Curves

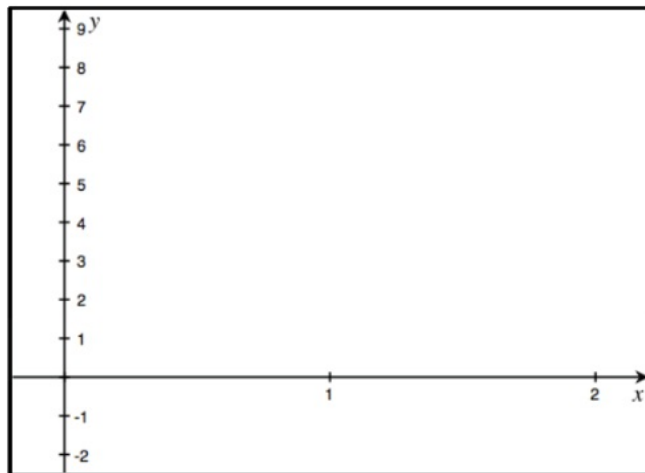


$$\int_a^b [f(x) - g(x)] dx$$

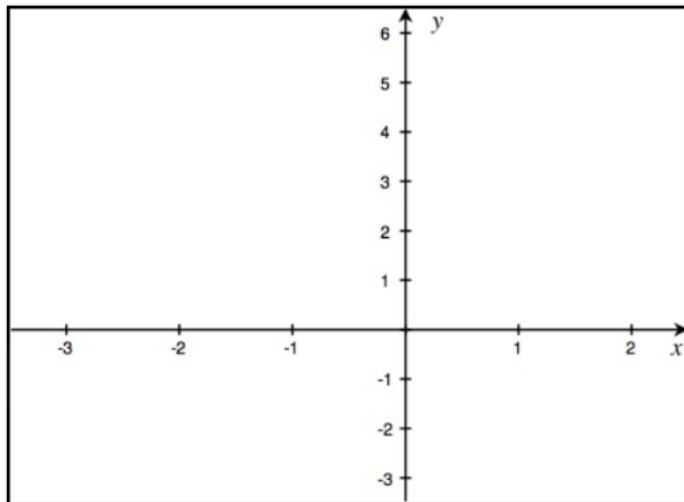
$$A = \int_a^b (\text{top function} - \text{bottom function}) dx \text{ for } a \leq x \leq b$$

$$A = \int_c^d (\text{right function} - \text{left function}) dy \text{ for } c \leq y \leq d$$

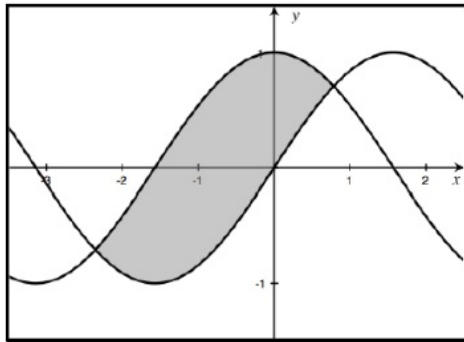
- 1) Find the area of the region bounded by the graphs of $y = x^2 + x + 2$, $y = -x$, $x = 0$, and $x = 2$. Sketch the curves, setup the integral, and give the answer.



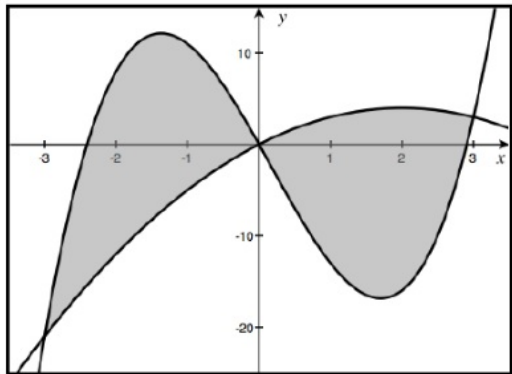
- 2) Find the area of the region bounded by the graphs of $y = 6 - x^2$ and $y = x$. Find the points of intersection, Sketch the curves, setup the integral and solve.



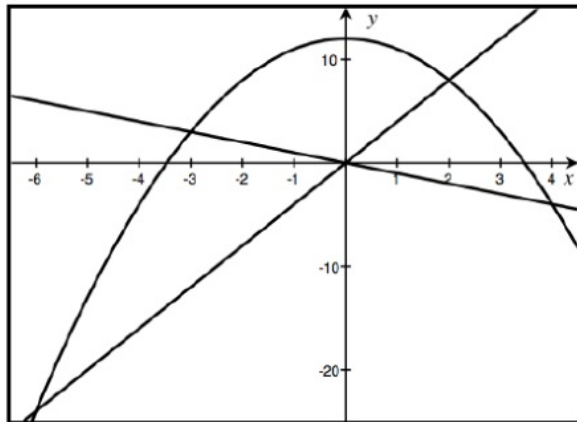
- 3) Find the exact area of the shaded region bounded by the graphs of $y = \sin x$ and $y = \cos x$.



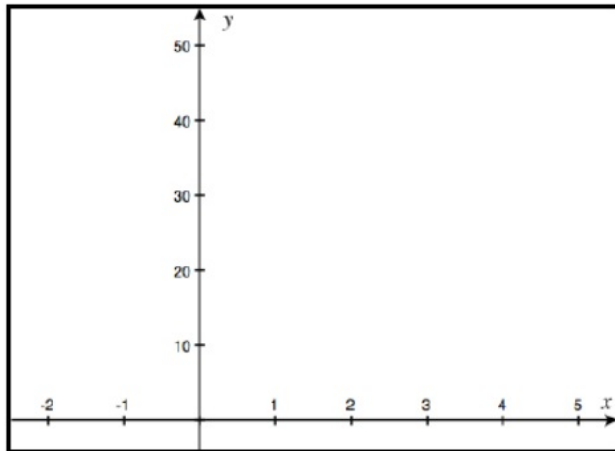
4) Find the area of the region bounded by the graphs of $y = 2x^3 - x^2 - 14x$ and $y = 4x - x^2$.



5) Find the area of the region bounded^{36b} by the graphs of $y = 12 - x^2$, $y = -x$, and $y = 4x$. Shade the area you are trying to find.



- 6) Determine the area of the region bounded by $y = 2x^2$, $y = 4x + 6$, $x = -2$, and $x = 5$.
Sketch the functions and shade the region.



7) Find the region bounded by the curves $x = 3 - y^2$ and $x = y + 1$.
Find their intersection and sketch the curves.

