Definite Integrals

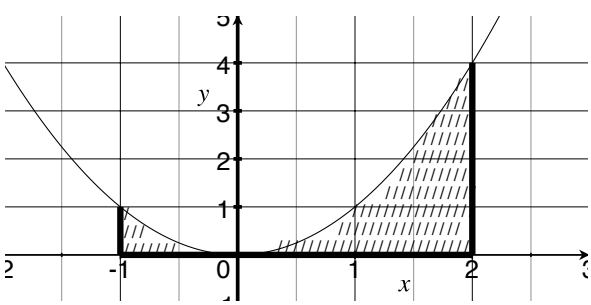
While working in a group make sure you:

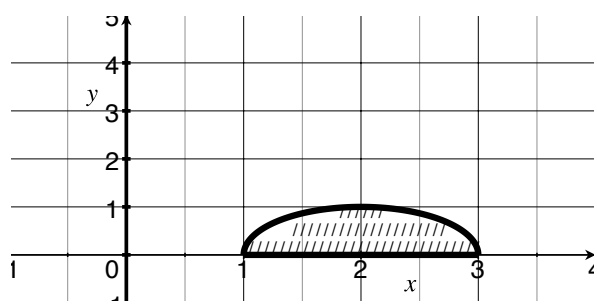
- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

1. Find:

$$\int_3^8 2\,dx \qquad\qquad \int_2^2 x - 1\,dx$$

2. Describe each of the shaded areas below as a definite integral given that the graph on the left is a quadratic and the graph on the right is of a semi-circle.





Property 1. *Let f and g be functions on $[a, b]$. Let c be a constant and d be in the domain of f and g, then:*

- $\displaystyle\int_a^a f(x)\,dx = 0$
- $\displaystyle\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$
- $\displaystyle\int_a^b c\,dx = c(b-a)$
- $\displaystyle\int_a^b [f(x) \pm g(x)]\,dx = \int_a^b f(x)\,dx \pm \int_a^b g(x)\,dx$
- $\displaystyle\int_a^b cf(x)\,dx = c\int_a^b f(x)\,dx$
- $\displaystyle\int_a^d f(x)\,dx + \int_d^b f(x)\,dx = \int_a^b f(x)\,dx$

3. Given $\displaystyle\int_2^4 x^3\,dx = 60$, $\displaystyle\int_2^4 x\,dx = 6$, and $\displaystyle\int_0^2 x\,dx = 2$ find the following:

$\displaystyle\int_2^4 x^3 - 5x\,dx$ $\qquad$ $\displaystyle\int_0^4 6x\,dx$ $\qquad$ $\displaystyle\int_4^4 x^3 - 5x\,dx$