

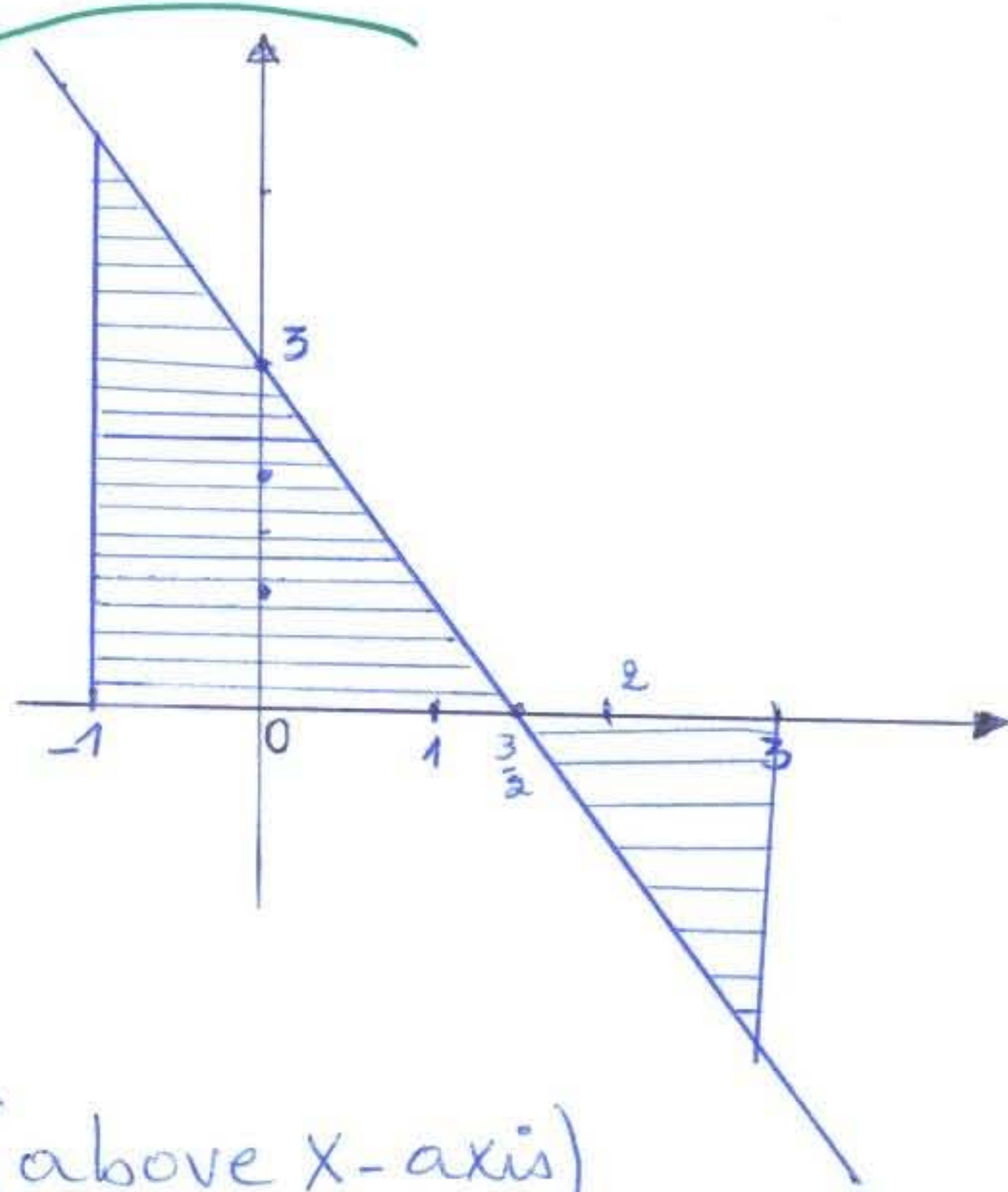
EXERCISE: Evaluate The integral I by interpreting it in terms of areas.

$$I = \int_{-1}^3 (3 - 2x) dx.$$

Solution:

$\int_{-1}^3 (3 - 2x) dx$ is The area

under the curve $f(x) = 3 - 2x$ from -1 to 3 , this are Composed into two parts:



First part: $\frac{1}{2}$ of a triangle (above x-axis)

with width $\frac{3}{2} + 1 = \frac{5}{2}$ and height 5.

$$\text{Then } A_1 = \frac{1}{2} \cdot \frac{5}{2} \cdot 5 = \frac{25}{4}.$$

Second part: $\frac{1}{2}$ of a triangle (Under x-axis) with

width $3 - \frac{3}{2} = \frac{3}{2}$ and height 3.

$$\text{Then } A_2 = -\frac{1}{2} \cdot \frac{3}{2} \cdot 3 = -\frac{9}{4}.$$

⇒ The total area is:

$$A = A_1 + A_2 = \frac{25}{4} - \frac{9}{4} = 4$$