

Each problem is worth 5 points. For full credit provide proper justification for your answer.

1. For the function  $f(x)$  shown at right, what

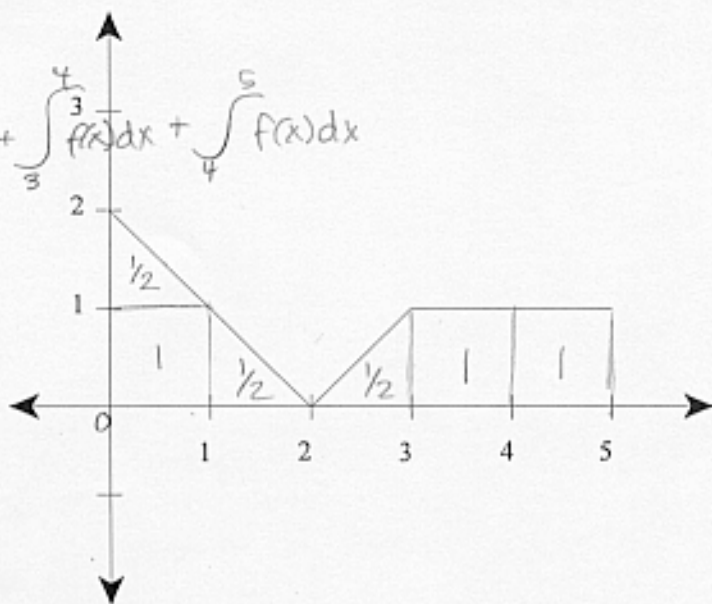
is the value of  $\int_0^5 f(x) dx$ ?

$$\int_0^5 f(x) dx = \int_0^1 f(x) dx + \int_1^2 f(x) dx + \int_2^3 f(x) dx + \int_3^4 f(x) dx + \int_4^5 f(x) dx$$

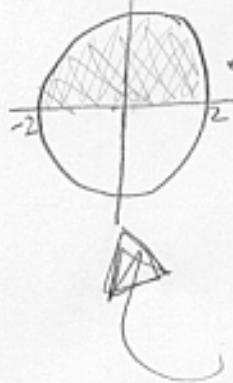
$$= (1 + \frac{1}{2}) + \frac{1}{2} + \frac{1}{2} + 1 + 1$$

$$= \boxed{4 \frac{1}{2}}$$

Excellent



2. What is the exact value of  $\int_{-2}^2 \sqrt{4-x^2} dx$ ?  $A_{\text{circle}} = \pi r^2$ , and we want  $\frac{1}{2} A$



$$\leftarrow \frac{1}{2} \text{ area} = \frac{1}{2} A$$

$$A = \pi (2)^2$$

$$A = 4\pi \cdot \frac{1}{2} = \boxed{2\pi}$$

$$(y)^2 = (\sqrt{4-x^2})^2$$

$$y^2 = 4 - x^2$$

Well done

$x^2 + y^2 = 4 \rightarrow$  a circle, but only the part of the circle btw. -2 and 2.

3. What is the exact value of  $\int_{-2}^0 x dx$

$$\int_a^b x dx = \frac{b^2}{2} - \frac{a^2}{2} \text{ so... } \int_{-2}^0 x dx = \frac{0^2}{2} - \frac{(-2)^2}{2} = \boxed{-2}$$

Great