ABCALC Definite Integrals Homework **Name:** _____

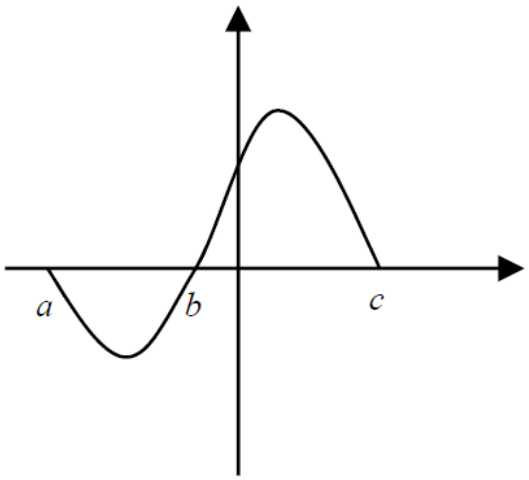
1. Graphically speaking, if $f(x)$ is always above the x-axis, what does $\int_a^b f(x)dx$ mean?

2. Given the graph of $f(x)$ below, answer the following questions.

   a) Is $\int_a^b f(x)dx$ positive, negative, or zero? Why?

   b) Is $\int_b^c f(x)dx$ positive, negative, or zero? Why?

   c) Is $\int_a^c f(x)dx$ positive, negative, or zero? Why?

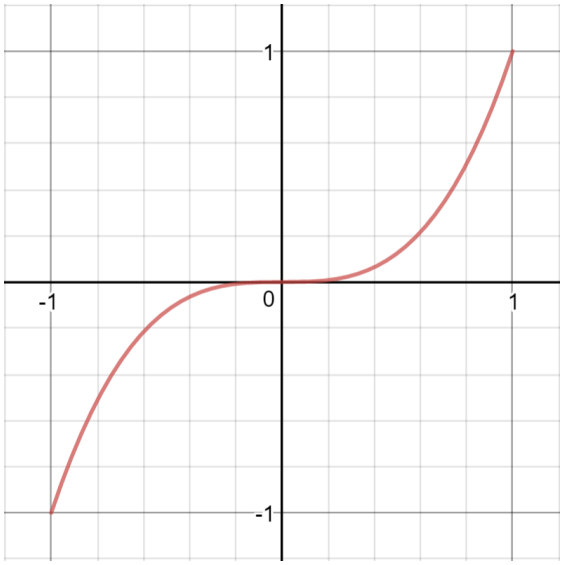


3. The graph of $y = x^3$ is given below. Use it and the fact that $\int_0^1 x^3 dx = \frac{1}{4}$ to evalute each of the following.

   a) $\int_{-1}^{1} x^3 dx$

   b) $\int_0^1 (x^3 + 3)dx$

   c) $\int_0^1 (x^3 - 1)dx$



4. Draw a sketch and shade the area indicated by each integral, then use geometry to evalute the integral.

   a) $\int_1^4 (-2x + 4)dx$

   b) $\int_{-4}^0 \sqrt{16 - x^2}\, dx$

   c) $\int_{-1}^1 (2 - |x|)dx$

5. If $\int_2^4 f(x)dx = 18$, then find $\int_2^5 (f(x) + 4)dx$

6. Draw a sketch for the area enclosed between the x-axis and the graph of $y = 4 - x^2$ over $[-2, 2]$. Set up an integral to find the area of the region and use your calculator to evaluate the integral.

7. Approximate the area under the curve defined by $y = x^2 - 2x + 3$ from $[-1, 3]$ using the left rectangular approximation method with 4 subintervals of equal length.

8. The function f is continuous over the closed interval $[0\ ,10]$ and has values that are given in the table.

x	0	2	5	7	10
$f(x)$	2	3	5	7	8

Using 4 subintervals, find each of the following approximations for the area under the curve from $[0\ ,10]$.

a) LRAM

b) RRAM

c) Trapezoid