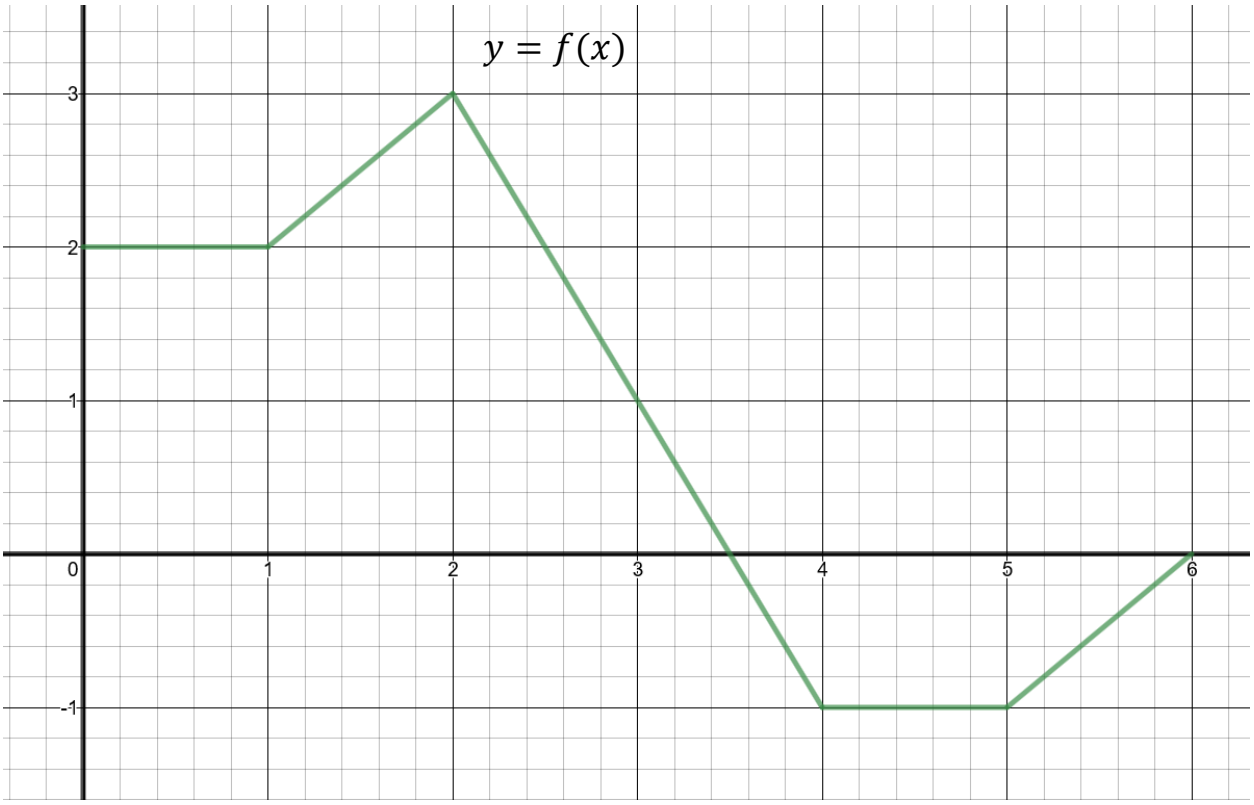
Definite Integrals- HW Problems

The graphs of $f(x)$ and $g(x)$ are shown below. Evaluate the following integrals by interpretting them in terms of area.

1.



$a.\quad \int_0^1 f(x)dx$

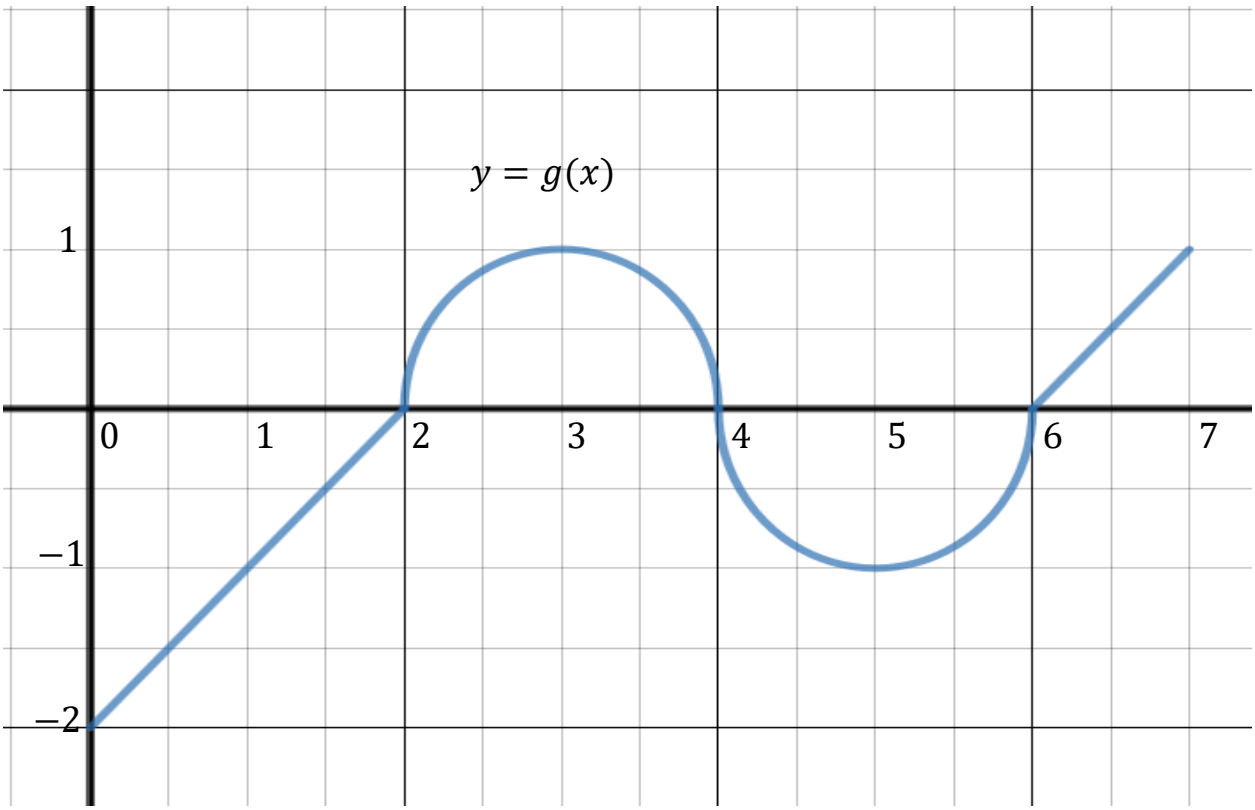
$b.\quad \int_0^3 f(x)dx$

$c.\quad \int_2^4 f(x)dx$

$d.\quad \int_3^6 f(x)dx$

$e.\quad \int_0^6 f(x)dx$

2.



a. $\int_0^2 g(x)dx$

b. $\int_2^4 g(x)dx$

c. $\int_0^4 g(x)dx$

d. $\int_2^6 g(x)dx$

e. $\int_4^6 g(x)dx$

f. $\int_0^7 g(x)dx$

3. Evaluate $\int_1^6 |6-2x|dx$ using areas.

4. Suppose $\int_1^6 f(x)dx = 10$ and $\int_4^6 f(x)dx = -4$ find

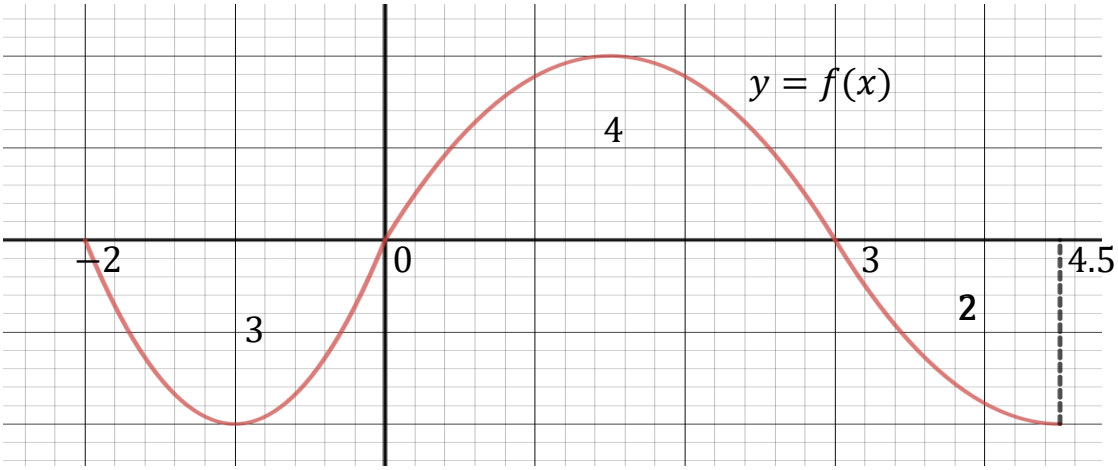
a. $\int_1^4 f(x)dx$

b. $\int_6^4 f(x)dx$

c. $\int_4^6 3f(x)dx$

d. $\int_1^6 -2f(x)dx$

5. A graph of $f(x)$ is given below with the areas of each region. Find:



a. $\int_{-2}^{4.5} f(x)dx$

b. $\int_{-2}^{4.5} |f(x)|dx$

c. $\int_0^{4.5} f(x)dx$

d. $\int_0^{4.5} |f(x)|dx$

e. $\int_3^0 f(x)dx$

6. Calculate $\int_0^6 (x^2 + 2)dx$ using the limit definition of the definite integral.

7. Identify which definite integral is represented by the following limits:

$a.$ $\lim_{max\Delta x_k \to 0} \sum_{k=1}^{n} \left(\sqrt{x_k^*} + 2(x_k^*)^2 - 3\right)\Delta x_k$ on $[1,4]$

$b.$ $\lim_{max\Delta x_k \to 0} \sum_{k=1}^{n} [(\cos(x_k^*))(\sin(x_k^*)) + (x_k^*)^4]\Delta x_k$ on $[0, \pi]$.