2. Suppose that the following is known about a function f:

$$\int_0^3 f(x)\,dx = 4 \qquad \text{and} \qquad \int_3^6 f(x)\,dx = -1$$

Find the following integrals.

a. $\int_0^6 f(x)\,dx$

$0 \to 3 + 3 \to 6$

$4 - 1 = \boxed{3}$

b. $\int_6^3 f(x)\,dx$ $\boxed{1}$

c. $\int_0^3 4f(x)\,dx$

$4(4) = \boxed{16}$

d. $\int_3^3 f(x)\,dx$ $\boxed{0}$

3. Evaluate the following integrals by making a graph of the function over the relevant interval.

a. $\int_{-3}^5 3\,dx$

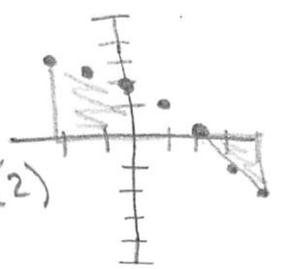
$3 \times 8 = \boxed{24}$

b. $\int_1^4 x\,dx$

$\frac{1}{2}(3)(3) + 3(1)$

$\frac{9}{2} + 3 = \boxed{\frac{15}{2}}$

c. $\int_{-2}^4 (2-x)\,dx$

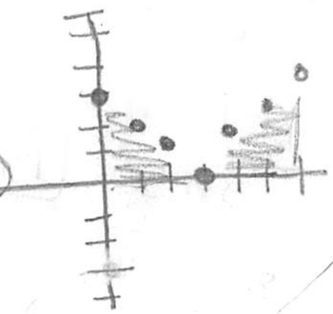


$\frac{1}{2}(4)(4) - \frac{1}{2}(2)(2)$

$8 - 2$

$\boxed{6}$

d. $\int_0^6 |x-3|\,dx$



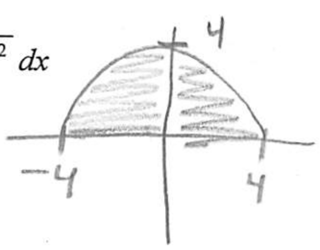
$\frac{1}{2}(3)(3) + \frac{1}{2}(3)(3)$

$4.5 + 4.5$

$\boxed{9}$

$A = 3 \cdot 3 = 9$

e. $\int_{-4}^4 \sqrt{16-x^2}\,dx$



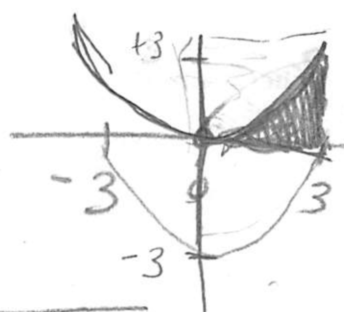
$A = \frac{\pi r^2}{2}$

$\frac{16}{2}\pi = \boxed{8\pi}$

★**f.** $\int_0^3 \left(3 - \sqrt{9-x^2}\right)dx$

$A = \frac{\pi r^2}{4}$

$A = \boxed{\frac{9}{4}\pi}$

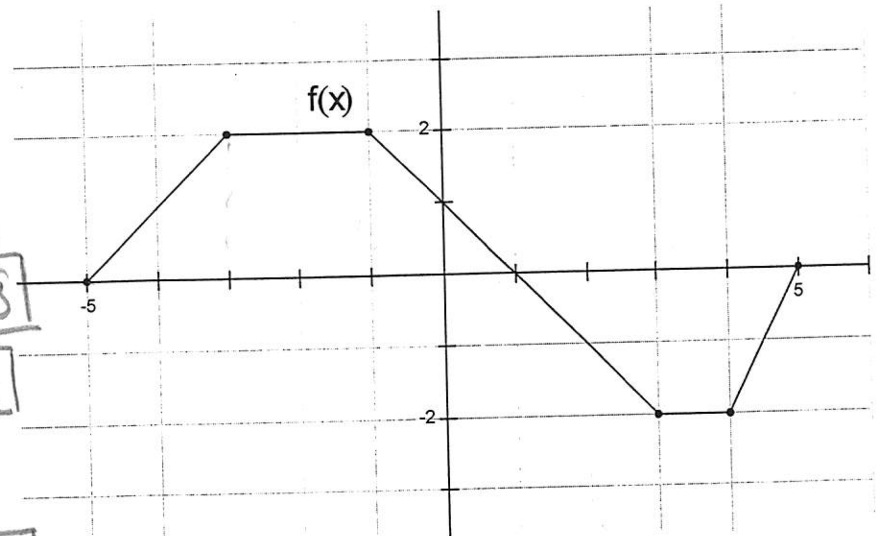


$\boxed{9 - \frac{9}{4}\pi}$

Iyabo Awogboro

Basic Integration

1. Consider the function $f(x)$ shown in the graph below. Use the graph to find the integrals that follow.



a. $\int_{-3}^{-3} f(x)\,dx$ $\boxed{0}$

b. $\int_{-5}^{1} f(x)\,dx$ $\frac{1}{2}(6+2)(2)$

$\frac{1}{2}(8)(2) = \boxed{8}$

c. $\int_{-5}^{3} f(x)\,dx$ $8-2 = \boxed{6}$

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

d. $\int_{-5}^{5} f(x)\,dx$ $8-5 = \boxed{3}$

$\frac{1}{2}(4+1)(2)$

$\frac{1}{2}(5)(2)$

e. $\int_{-3}^{-5} f(x)\,dx$ $\frac{1}{2}(2)(2)$

$\boxed{-2}$

f. $\int_{5}^{1} f(x)\,dx$ $\boxed{+5}$

$\frac{1}{2}(1+4)(2)$

$\frac{1}{2}(5)(2)$

g. $\int_{5}^{-5} f(x)\,dx$ $\boxed{-3}$

h. $\int_{-5}^{5} |f(x)|\,dx$

$8+5 = \boxed{13}$

i. $\int_{-5}^{1} (f(x)+2)\,dx$

2 12 6

$8 + 12 = \boxed{20}$

j. $\int_{-5}^{1} 3f(x)\,dx$

$3(8) = \boxed{24}$

k. $\int_{-5}^{5} (3+|f(x)|)\,dx$

$13+30 = \boxed{43}$

3 10

Generalizations Now make some generalizations about integration.

~~Review Trapezoidal method~~

~~p 316 # 5, ~~8~~ 7,~~

p 318 # 31, 32, 34