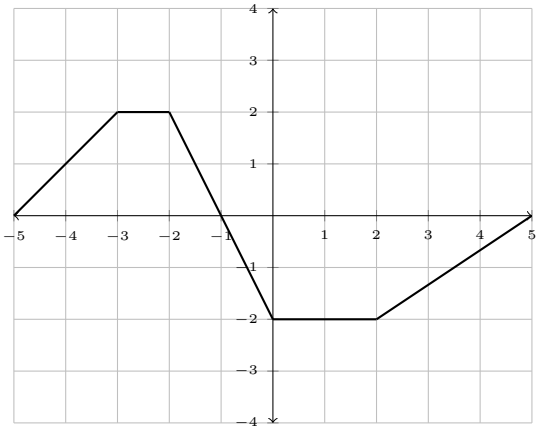
1. Given the following graph of f, find:



(a) $\int_{-5}^{-3} f(x)\ dx$

(b) $\int_{-5}^{-1} f(x)\ dx$

(c) $\int_{-3}^{1} f(x)\ dx$

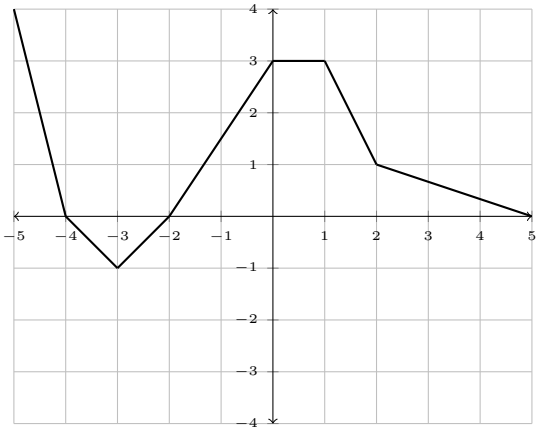
(d) $\int_{-1}^{2} f(x)\ dx$

(e) $\int_{-5}^{5} f(x)\ dx$

(f) $\int_{5}^{-5} f(x)\ dx$

(g) $\int_{-2}^{-4} f(x)\ dx$

2. Given the following graph of g, find:



(a) $\int_{-5}^{-2} g(x)\ dx$

(b) $\int_{-2}^{0} g(x)\ dx$

(c) $\int_{-5}^{0} g(x)\ dx$

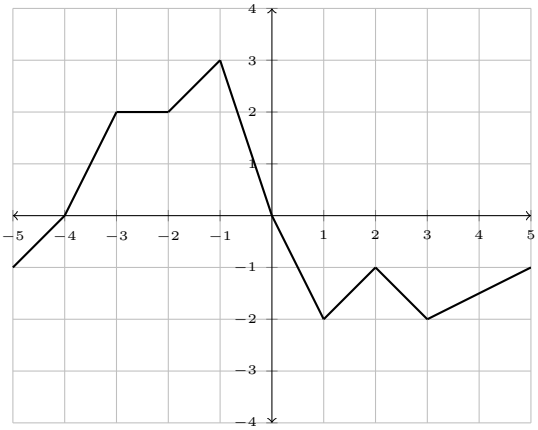
(d) $\int_{-1}^{1} g(x)\ dx$

(e) $\int_{-2}^{2} g(x)\ dx$

(f) $\int_{3}^{3} g(x)\ dx$

(g) $\int_{-5}^{5} g(x)\ dx$

3. Given the following graph of h, find:



(a) $\int_{-5}^{-2} h(x)\ dx$

(b) $\int_{0}^{-4} h(x)\ dx$

(c) $\int_{0}^{5} h(x)\ dx$

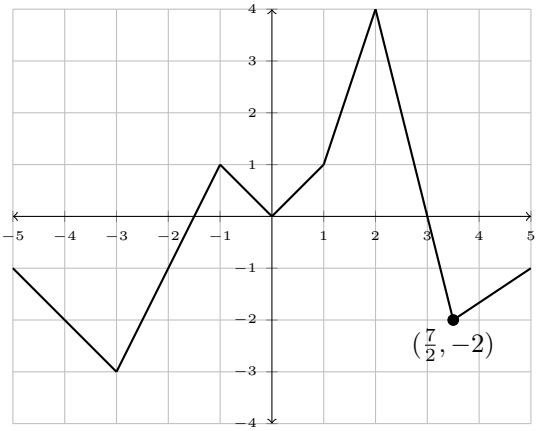
(d) $\int_{-1}^{-1} h(x)\ dx$

(e) $\int_{-1}^{1} h(x)\ dx$

(f) $\int_{-1}^{1} 2h(x)\ dx$

(g) $\int_{-1}^{1} |h(x)|\ dx$

4. Given the following graph of p, find:



(a) $\int_{-3}^{-5} p(x)\ dx$

(b) $\int_{-3}^{2} p(x)\ dx$

(c) $\int_{2}^{5} p(x)\ dx$

(d) $\int_{-5}^{5} p(x)\ dx$

(e) $\int_{-3}^{0} -p(x)\ dx$

(f) $\int_{-4}^{1} |p(x)|\ dx$

(g) $\int_{-2}^{-3} 3p(x)\ dx$

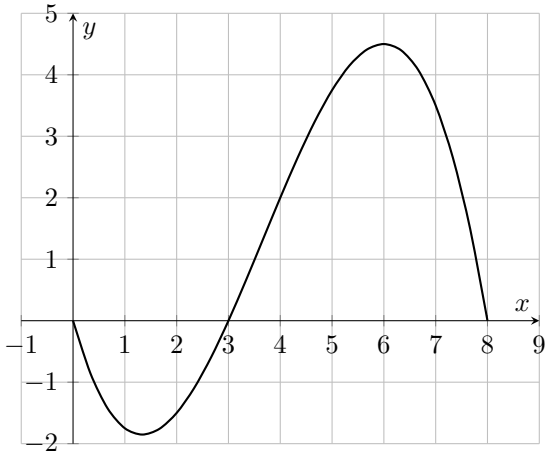
5. Use the graphs of f, g, h, and p in the questions above. Find:

(a) $\int_{-5}^{5} f(x) + g(x)\ dx$

(b) $\int_{-3}^{0} p(x) - h(x)\ dx$

(c) $\int_{0}^{1} 2f(x) + g(x) - 3h(x) - 4p(x)\ dx$

6. For the function f whose graph is shown, list the following quantities in increasing order, from smallest to largest.



() $\displaystyle\int_0^8 f(x)\,dx$ () $\displaystyle\int_0^3 f(x)\,dx$

() $\displaystyle\int_3^8 f(x)\,dx$ () $\displaystyle\int_4^8 f(x)\,dx$

7. Evaluate the integral by interpreting it in terms of areas.

(a) $\displaystyle\int_0^3 4x\,dx$

(b) $\displaystyle\int_0^8 (3-2x)\,dx$

(c) $\displaystyle\int_{-2}^5 (10-5x)\,dx$

(d) $\displaystyle\int_{-2}^5 |10-5x|\,dx$

(e) $\displaystyle\int_{-4}^3 \left|\frac{1}{2}x\right|\,dx$

(f) $\displaystyle\int_1^1 \sqrt{1+x^4}\,dx$

8. Evaluate the integrals:

(a) $\displaystyle\int_1^5 |x-3|\,dx$

(b) $\displaystyle\int_{-4}^1 |x+2|\,dx$

(c) $\displaystyle\int_{-2}^4 |2x-5|\,dx$

(d) $\displaystyle\int_{-1}^5 |3x-2|\,dx$

(e) $\displaystyle\int_3^7 |5-x|\,dx$

(f) $\displaystyle\int_{-8}^{-2} |-x-6|\,dx$

(g) $\displaystyle\int_{-2}^3 |4-4x|\,dx$

(h) $\displaystyle\int_{-1}^4 |5-3x|\,dx$

ANSWERS:

(1) (a) 2
(b) 5
(c) 0
(d) -5
(e) -3
(f) 3
(g) $-\frac{7}{2}$

(2) (a) 1
(b) 3
(c) 4
(d) $\frac{21}{4}$
(e) 8
(f) 0
(g) $\frac{21}{2}$

(3) (a) $\frac{5}{2}$
(b) -7
(c) -7
(d) 0
(e) $-\frac{1}{2}$
(f) -1
(g) $\frac{1}{2}$

(4) (a) 4
(b) $\frac{3}{2}$
(c) $-\frac{3}{4}$
(d) $-\frac{19}{4}$
(e) $\frac{3}{2}$
(f) $\frac{7}{2}$
(g) -6

(5) (a) $\frac{15}{2}$
(b) $-\frac{15}{2}$
(c) 0

(6) B < A < D < C

(7) (a) 18
(b) -40
(c) $\frac{35}{2}$
(d) $\frac{125}{2}$
(e) $\frac{25}{4}$
(f) 0

(8) (a) 4
(b) $\frac{13}{2}$
(c) $\frac{45}{2}$
(d) $\frac{97}{3}$
(e) 4
(f) 10
(g) 26
(h) $\frac{113}{6}$