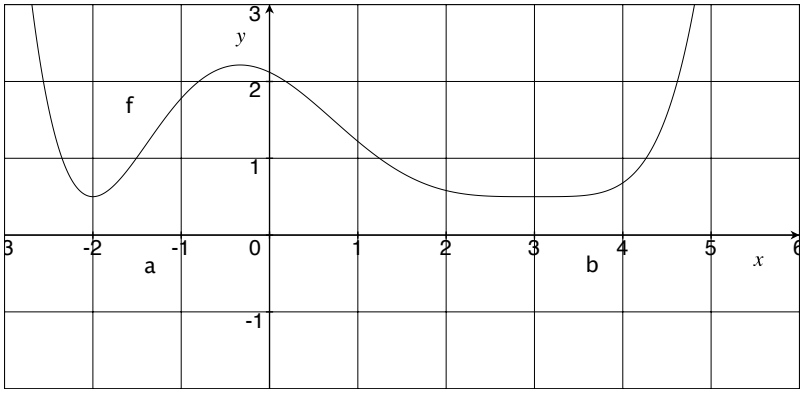
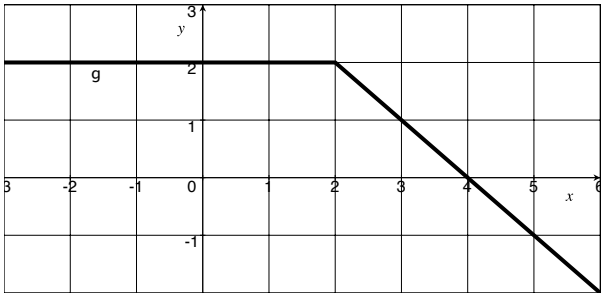
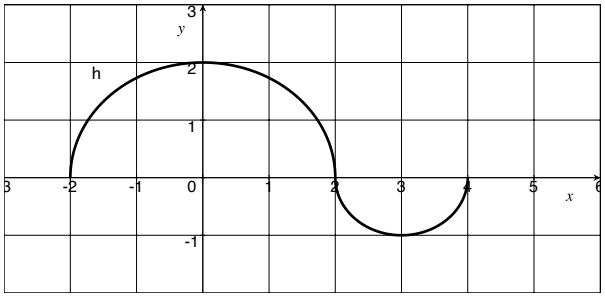
Area between Curves

Recall is the graph of f is given as below then $\int_a^b f(x)\,dx$ corresponds to the area shaded below.



1. Let g and h have the graphs below.



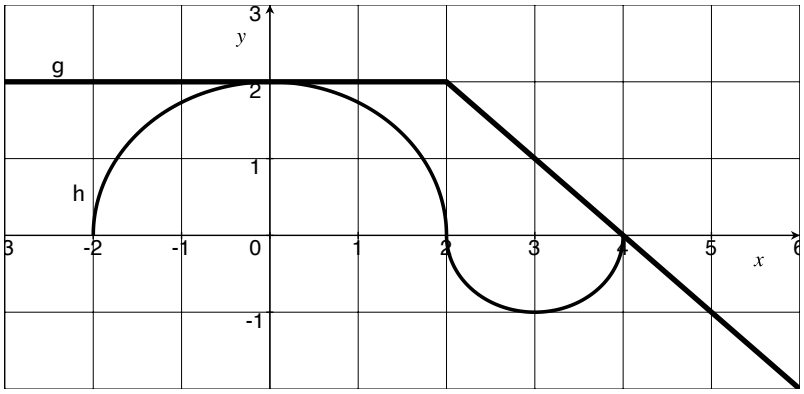


   (a) Find $\int_{-2}^{2} g(x)\,dx$.

   (b) Find $\int_{-2}^{5} g(x)\,dx$.

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

   (d) Find $\int_{-2}^{5} f(x)\,dx$.



(e) Consider the area bounded between g and h. Use your work in (a) and (c) to find the area bounded between g and h from $x = -2$ to $x = 2$.

(f) Use approximating rectangles with Δx equal to .5 and approximate the area in part (e). How did you find the height of the rectangles? How would you find the height of the rectangles if you weren't given the graph but only the rules of g and h?

(g) Write the area you calculated in part (e) with integral notation.

Verify your answer by looking at the figure on page 252.

(h) Find the area bounded between g and h from $x = 2$ to $x = 4$.

(i) Will the same formula (but with the limits of integration moved appropriately) still work to calculate this area? i.e. is the area you calculated in part (h) still represented by $\int_2^4 g(x) - h(x)\,dx$?