

Show all work. Your answers must be fully justified.

1. Consider the region that is between the x -axis and the function $f(x) = 6 - x^2$ from $x = 1$ to $x = 2$.

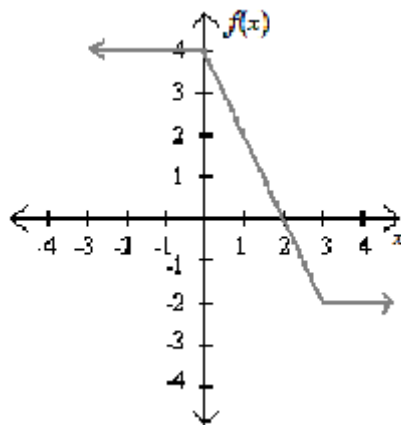
(a) Sketch the region.

(b) Estimate the area of the region using R_2 .

(c) Write an expression for the exact area of the region as the limit of a Riemann sum.

(d) Write an expression for the exact area of the region as a definite integral.

2. Let $f(x)$ be the function sketched below:



Find $\int_{x=-2}^{x=4} f(x) dx$ exactly.