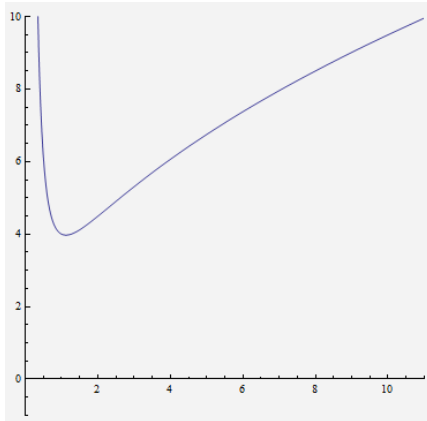Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the average value of the function $f(x) = \dfrac{1}{x^2} + 3\sqrt{x}$ over the interval $[1, 4]$.

2. Find the area of the region enclosed by the curves $f(x) = -2x$ and $g(x) = x^3 - 3x^2$.