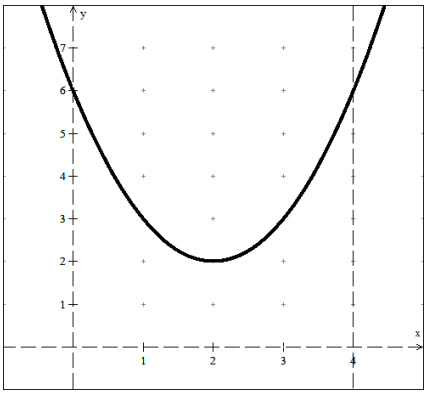
AP Calculus AB
Section 8.3 – Notesheet

Name: _____
Date: _____ Block: _____

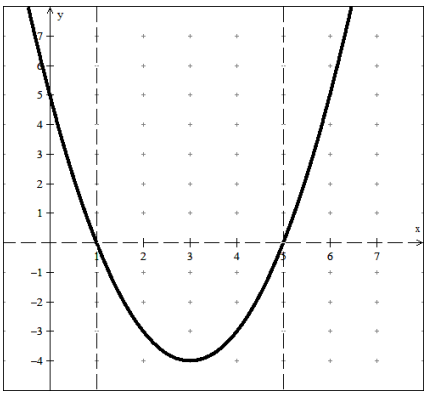
The area between a curve $f(x)$ and the $x$ – axis on an interval $[a, b]$ is defined to be $\int_a^b f(x)\,dx$ if all points on the curve are above the $x$ – axis.

Example 1: Find the Total Area Enclosed by $y = x^2 - 4x + 6$, $y = 0$, $x = 0$ and $x = 4$.



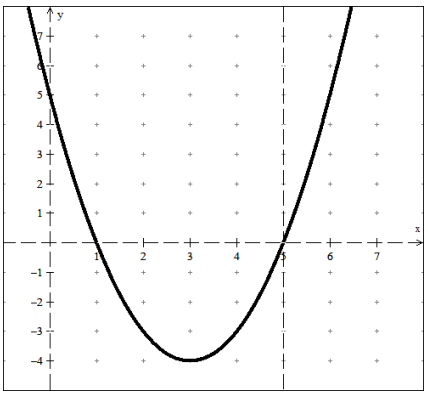

The area between a curve $f(x)$ and the $x$ – axis on an interval $[a, b]$ is defined to be $-\int_a^b f(x)\,dx$ if all points on the curve are below the $x$ – axis.

Example 2: Find the Total Area Enclosed by $y = x^2 - 6x + 5$, $y = 0$, $x = 1$ and $x = 5$.

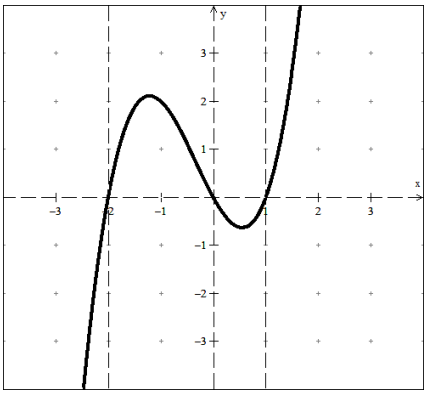



The area between a curve $f(x)$ and the $x$ – axis on an interval $[a, c]$ is defined to be $\int_a^b f(x)\,dx - \int_b^c f(x)\,dx$ if all points in $[a, b]$ are above the $x$ – axis and all points in $[b, c]$ are below the $x$ – axis.

Example 3: Find the Total Area Enclosed by $y = x^2 - 6x + 5$, $y = 0$, $x = 0$ and $x = 5$.

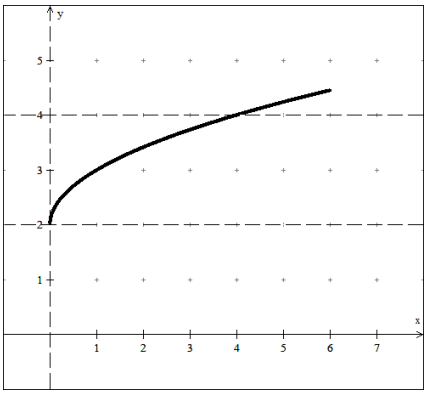


Example 4: Find the Total Area Enclosed by $y = x^3 + x^2 - 2x$, $y = 0$, $x = -2$ and $x = 1$.



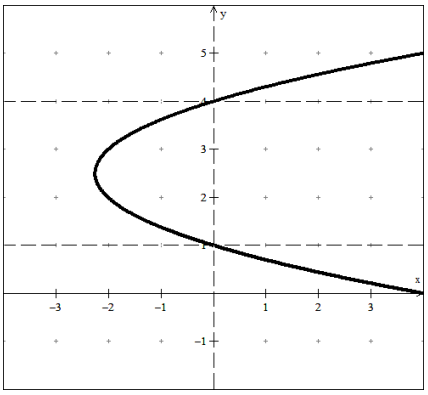

The area between a curve $f(y)$ and the $y$ – axis on an interval $[a, b]$ is defined to be $\int_a^b f(y)\,dy$ if all points on the curve are above the $y$ – axis.

Example 1: Find the Total Area Enclosed by $y = \sqrt{x} + 2$, $x = 0$, $y = 2$ and $y = 4$.



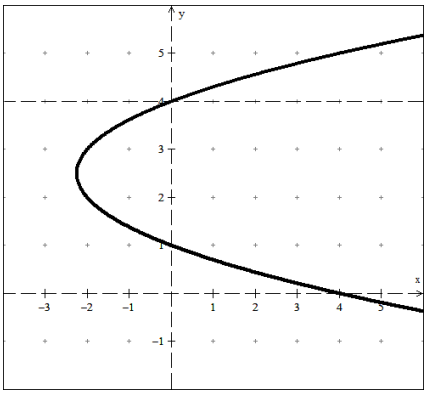

The area between a curve $f(y)$ and the $y$ – axis on an interval $[a, b]$ is defined to be $-\int_a^b f(y)\,dy$ if all points on the curve are below the $y$ – axis.

Example 2: Find the Total Area Enclosed by $x = y^2 - 5y + 4$, $x = 0$, $y = 1$ and $y = 4$.



The area between a curve $f(y)$ and the $y$ – axis on an interval $[a, c]$ is defined to be $\int_a^b f(y)\,dy - \int_b^c f(y)\,dy$ if all points in $[a, b]$ are above the $y$ – axis and all points in $[b, c]$ are below the $y$ – axis.

Example 3: Find the Total Area Enclosed by $x = y^2 - 5y + 4$, $x = 0$, $y = 0$ and $y = 4$.




Example 4: Find the Total Area Enclosed by $y = \sqrt[3]{\frac{1}{2}x + 2}$, $x = 0$, $y = 1$ and $y = 3$.