

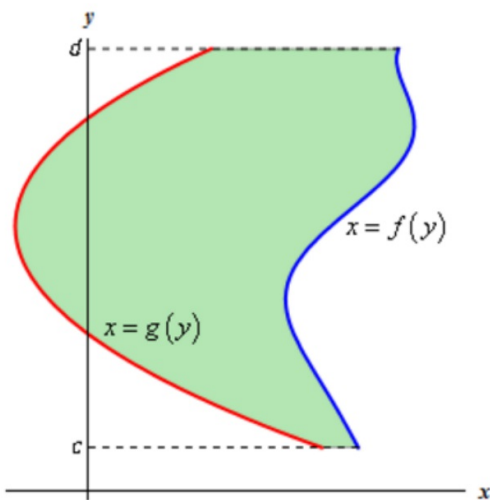
AREA BETWEEN TWO CURVES Day Two

Objective:

- Find the area between curves (integrating with respect to y).

Investigation: Find the area in the first quadrant that is bounded above by $y = \sqrt{x}$ and below by the x -axis and the line $y = x - 2$. (no calculators)

$$\text{Area} = \int_c^d (\text{right curve}) - (\text{left curve}) dy$$



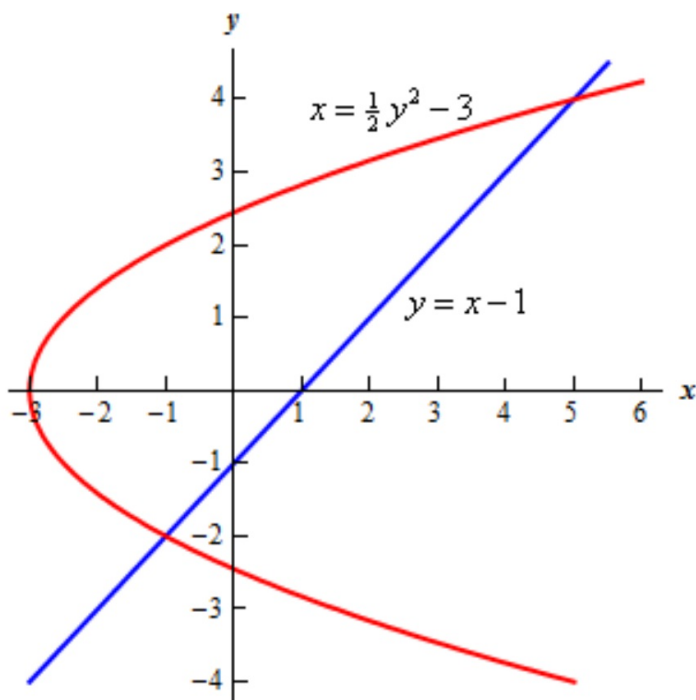
$$A = \int_c^d [f(y) - g(y)] dy$$

Sometimes the boundaries of a region are more easily described by functions of y (using y -limits).

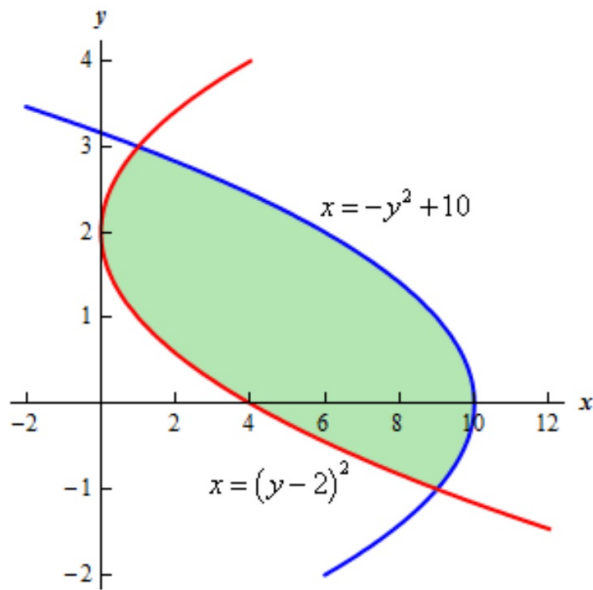
Solve the equation for x (in terms of y)

Integrate with respect to y (dy).

Ex. 1: (no calculator)



Ex.2: (no calc)



Ex.3 (calc): Find the area of the region enclosed by the graphs of $y = x^3$ and $x = y^2 - 2$.

Ex.4 (calc): Find the area enclosed by the graphs of the two curves $y^2 = x + 1$ and $y^2 = 3 - x$

Ex.5 (calc) - AP Question

Let R be the region in the first quadrant bounded by the x -axis and the graphs of $y = \ln x$ and $y = 5 - x$ shown below. Find the area of R .

