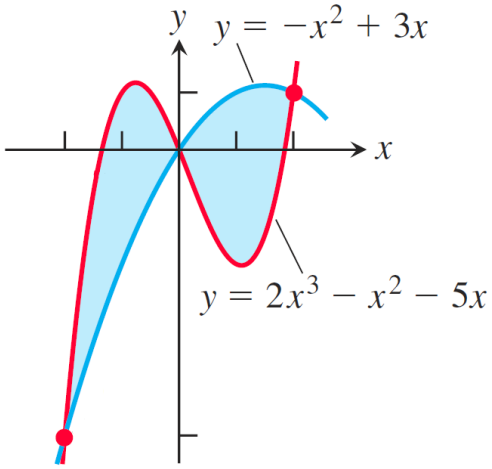
Tutorial Worksheet

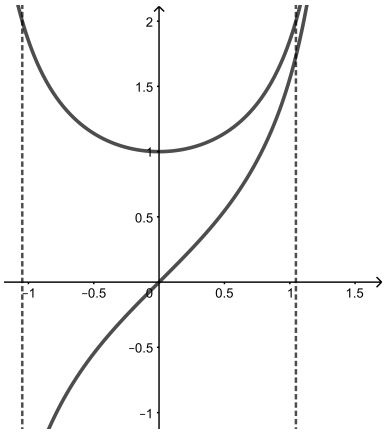
1. Evaluate the following definite integral.

$$\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cot t \; dt$$

2. Write the integral for the area of the shaded region bounded by the two functions, $y = -x^2 + 3x$ and $y = 2x^3 - x^2 - 5x$. You do not need to evaluate the integral.



3. A solid object lies between planes perpendicular to the x-axis at $x \in \left[-\frac{\pi}{3}, \frac{\pi}{3}\right]$ and has perpendicular cross-sections to the x-axis that are circular disks with diameters running from the curve $y = \tan x$ to the curve $y = \sec x$. Write the integral for the volume of this solid object. You do not need to evaluate the integral.



4. Write the integral for the volume of the solid generated by revolving the region bounded by the parabola $x = \frac{y^2}{9}$ and the line $x = 1$ about the line $x = 2$. You do not need to evaluate the integral.