

## Math 221, Quiz 6, 12 April 2002

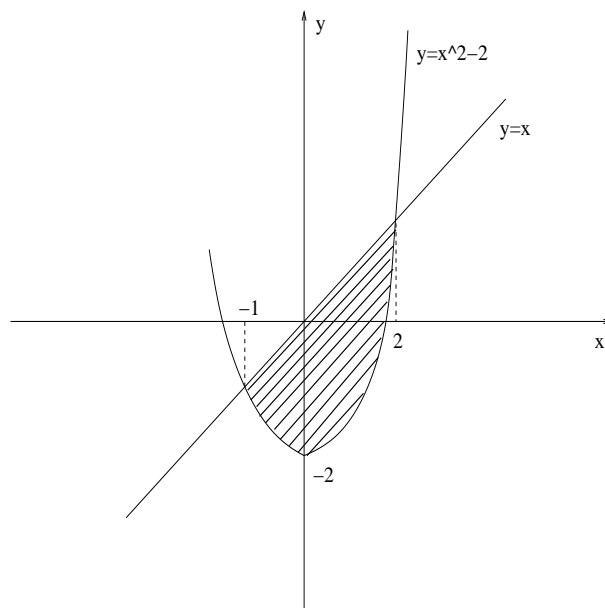
### Answers

I. (5 points) Let  $F(x) = \int_1^x \frac{dt}{2+t^2}$ . Find  $F'(x)$ .

**Answer:** By the Fundamental Theorem of Calculus, Part I,

$$F'(x) = \frac{1}{2+x^2}.$$

II. (15 points) Find the area of the region bounded by the line  $y = x$  and the curve  $y = x^2 - 2$ .



**Answer:**

$$\begin{aligned} \text{Area} &= \int_{-1}^2 (x - (x^2 - 2)) dx \\ &= \int_{-1}^2 (x - x^2 + 2) dx \\ &= \left( \frac{x^2}{2} - \frac{x^3}{3} + 2x \right) \Big|_{-1}^2 \\ &= (2^2/2 - 2^3/3 + 2 \cdot 2) - ((-1)^2/2 - (-1)^3/3 + 2 \cdot (-1)) \\ &= 9/2 \end{aligned}$$