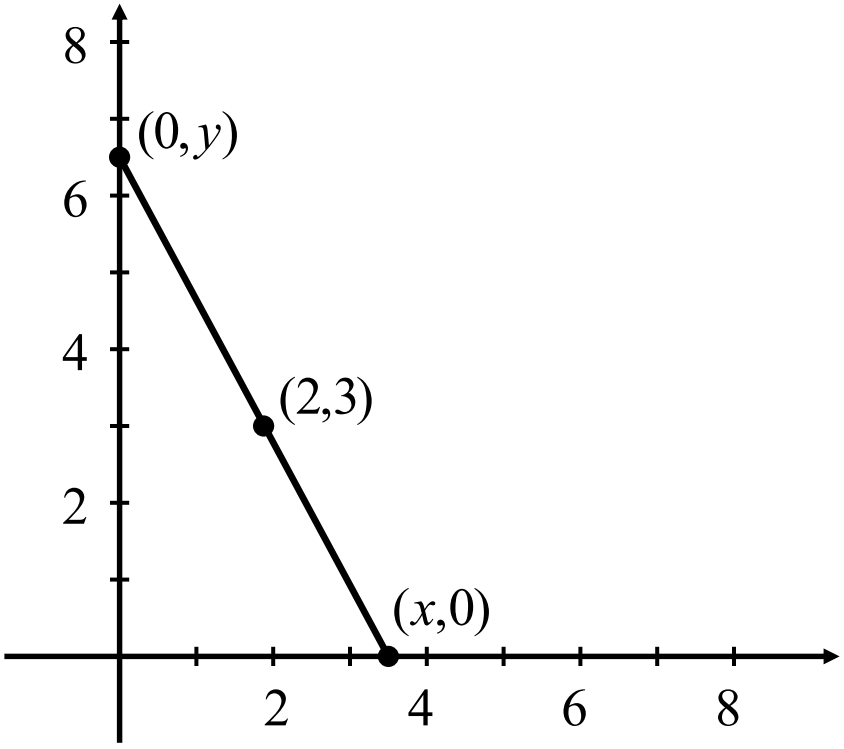
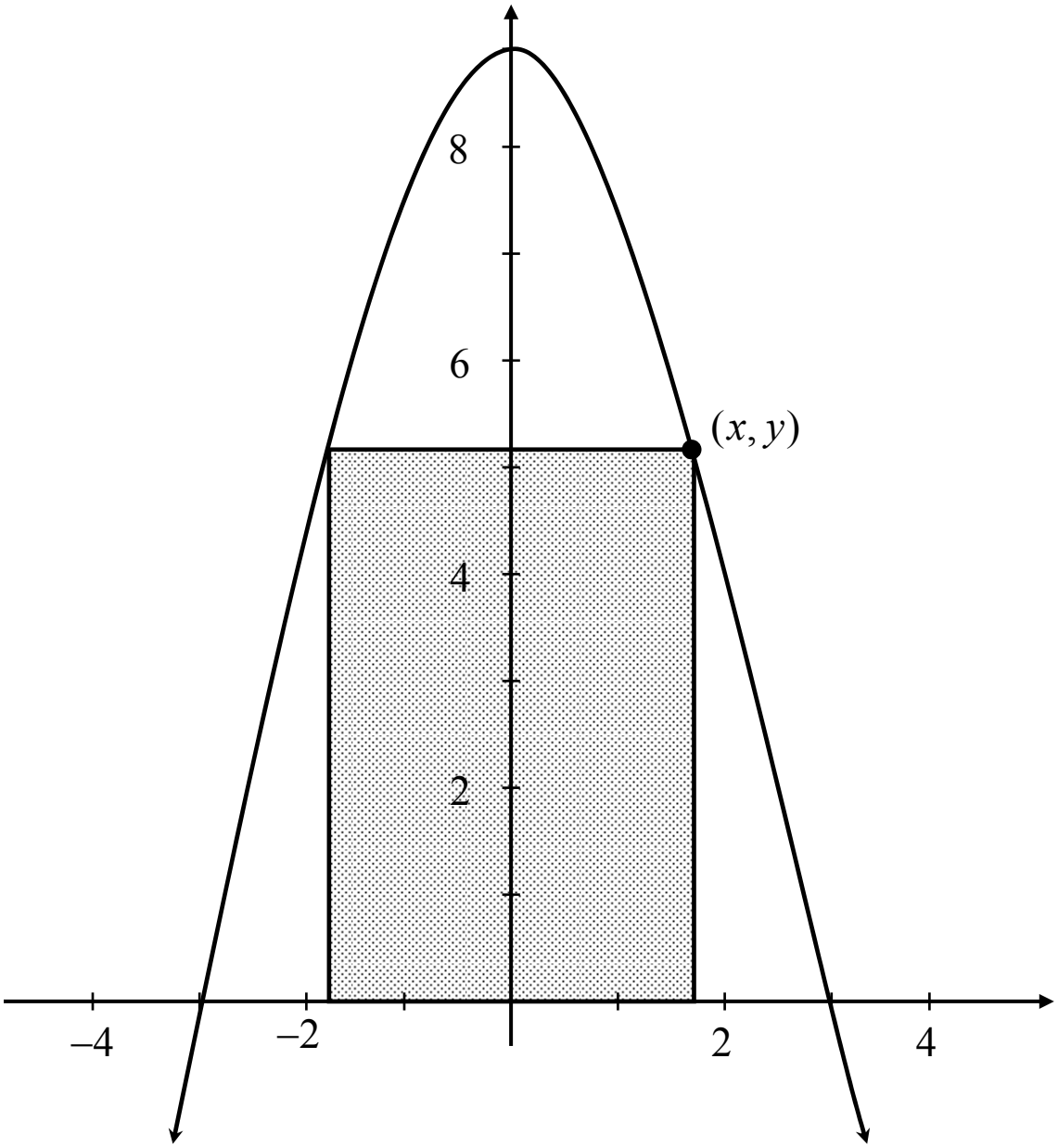
A triangle is formed in the first quadrant by a line segment passing through the point $(2,3)$ and intersecting the $x$- and $y$-axes. Write an equation for the length $L$ of the hypotenuse as a function of $x$, the $x$-coordinate at which the segment intersects the $x$-axis. Determine the domain of the function.



A rectangle bounded below by the $x$-axis is inscribed in the parabola given by $y = 9 - x^2$. Write an equation expressing the area $A$ of the rectangle as a function of $y$, the $y$-coordinate of the rectangle's vertex in the first quadrant. Determine the domain of the function.



Answers

$$L = \sqrt{x^2 + \left(\frac{3x}{x-2}\right)^2}$$

DOM $L = (2, \infty)$

$$A = 2y\sqrt{9-y}$$

DOM $A = [0, 9]$