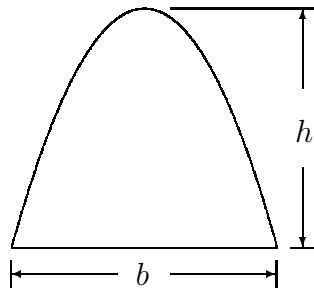
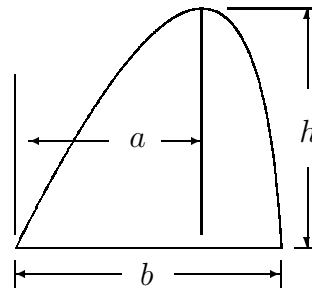


These problems are to be solved collaboratively in your outside groups. It will be due in class Monday February 27. You may use other books, computers, and calculators. Your grade will depend on the correctness of the solution, quality of the exposition, and evidence of collaboration.

1. Find a formula for area of the figure bounded by a parabolic arc and a line segment perpendicular to the axis of the parabola. Formula should be in terms of the length b of the base and the height h (see the figure labeled **symmetric parabola**). You should have a detailed description of why your formula holds even if you use the computer to do most of the calculations.



Symmetric Parabola



Skew Parabola

For extra credit you can do the same thing for the skew parabola as in the second figure in terms of b , h , and a .

2. A projectile is shot from the top of a 200-foot high building with initial horizontal velocity $x'(0) = 10\text{ft/sec}$ and initial vertical velocity of $y'(0) = 5\text{ft/sec}$. Ignore friction due to air and find the length the trajectory until it hits the ground. Note that by Newton's laws $x'' = 0$ and $y'' = -32$.
- 3.