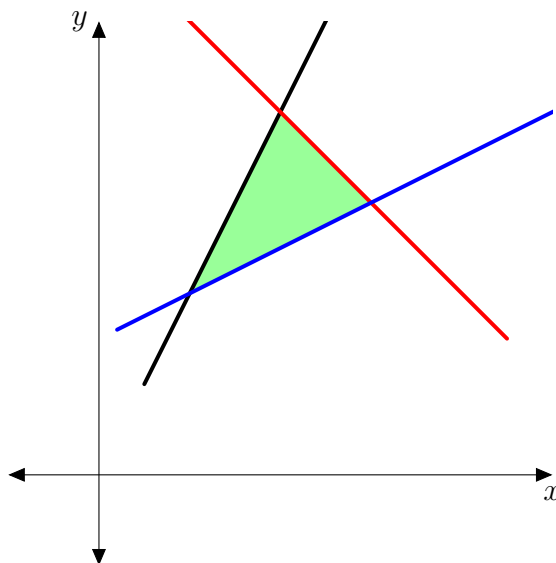
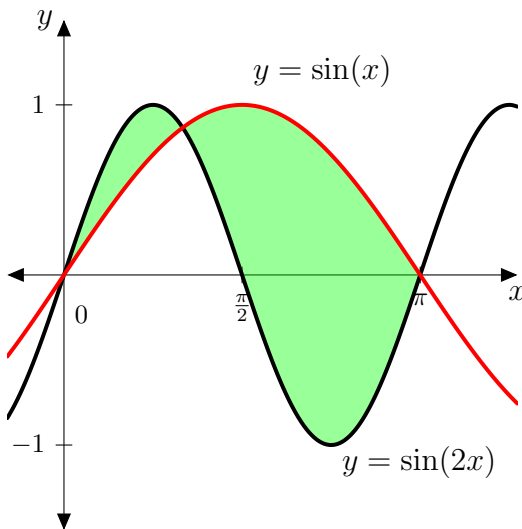

Areas Between Curves

Solutions should show all of your work, not just a single final answer.

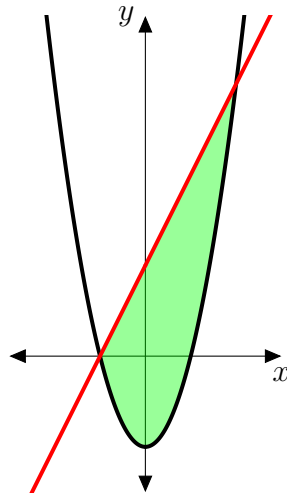
1. We want to find the area of the triangle with vertices $(1, 2)$, $(2, 4)$, and $(3, 3)$, by calculus.



- (a) Find equations for the three lines connecting the vertices.
(b) Use the equations in part a to express the area of the triangle in terms of integrals, and then compute the area.
2. Find the area of the regions below between $y = \sin x$ and $y = \sin(2x)$ for $0 \leq x \leq \pi$. (Hint: To find the exact coordinates of the point where the graphs cross, recall that $\sin(2x) = 2 \sin x \cos x$.)



3. We want to find the area of the region bounded by $y = 2x + 4$ and $y = x^2 - 4$.



- Determine the coordinates of the points where the line and parabola intersect.
- Express the area as an integral with respect to x .
- Express the area as an integral with respect to y .
- Explain which of (a) or (b) is simpler to compute, and use the simpler one to find the area.