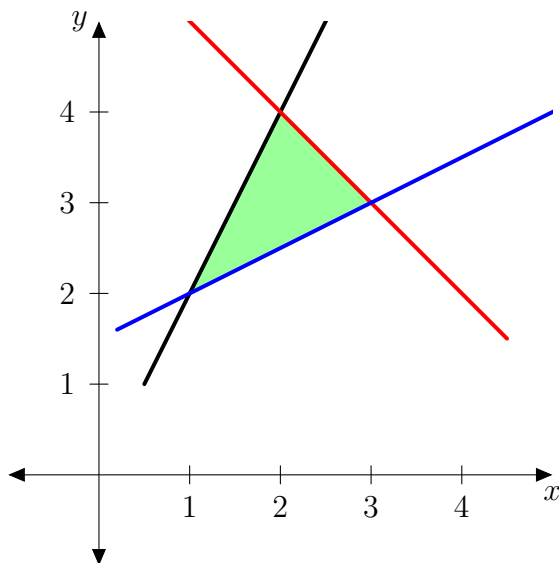
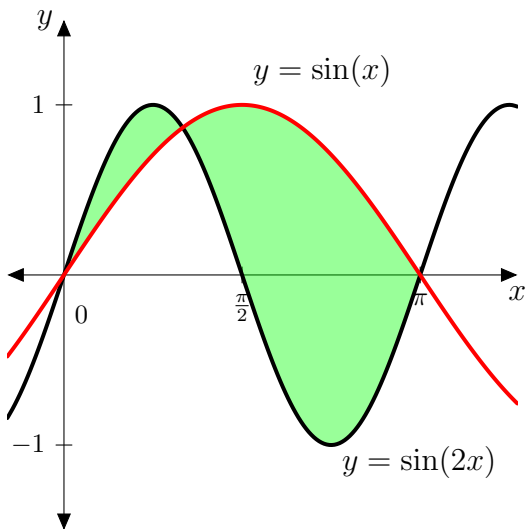

Areas Between Curves

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

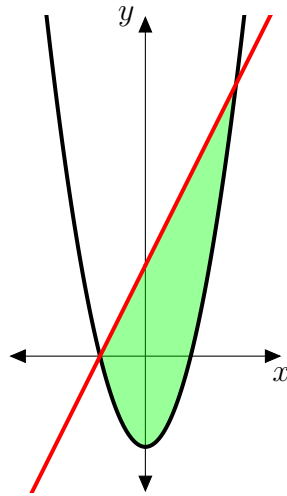
1. We want to find the area of the triangle with vertices $(1, 2)$, $(2, 4)$, and $(3, 3)$, by calculus.



- (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. Simplify your final answer.