Problems esergel52, esergel53, and esergel54 are intended to be used together.

1. (a) Use geometry to justify the formula $\int_0^b x\,dx = \frac{b^2}{2}$ when $b > 0$.

   (b) Justify this formula when $b < 0$. Remember that $\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$.

   (c) What is the area under the curve $f(x) = x$ between $x = a$ and $x = b$ when $0 < a < b$?

   (d) Check that this same formula also works when $a < 0 < b$. Draw a picture to illustrate your ideas.

   (e) Use geometry to evaluate the integrals $\int_{-1}^{3} 7x\,dx$ and $\int_{-2}^{5} (3x + 6)\,dx$. Draw pictures of the two areas being computed. Check your answers against the formula from part (d). Use the properties of integrals discussed in class, and remember that $\int_a^b K\,dx = K(b - a)$.