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

1. Recall that $\int_0^b x^2\, dx = \frac{b^3}{3}$. In the bonus question after this, you will justify this formula for $b > 0$ using Riemann sums. For now, assume that this is true when $b > 0$.

   (a) How does $\int_0^5 x^2\, dx$ relate to $\int_{-5}^0 x^2\, dx$? Draw a picture to illustrate your ideas.

   (b) What is $\int_0^{-5} x^2\, dx$? What is the general formula for $\int_0^b x^2\, dx$ when $b < 0$?

   (c) Use properties of integrals to find a formula for $\int_a^b x^2\, dx$ when $0 < a < b$.

   (d) Justify that your formula from part (c) also works when $a < 0 < b$.