

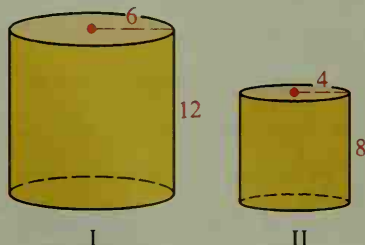
12-5 Areas and Volumes of Similar Solids

One of the best-known attractions in The Hague, the Netherlands, is a unique miniature city, Madurodam, consisting of five acres of carefully crafted reproductions done on a scale of 1:25. Everything in this model city works, including the two-mile railway network, the canal locks, the harbor fireboats, and the nearly 50,000 tiny street lights. In this section you will study the relationship between scale factors of *similar solids* and their areas and volumes.



Similar solids are solids that have the same shape but not necessarily the same size. It's easy to see that all spheres are similar. To decide whether two other solids are similar, determine whether bases are similar and corresponding lengths are proportional.

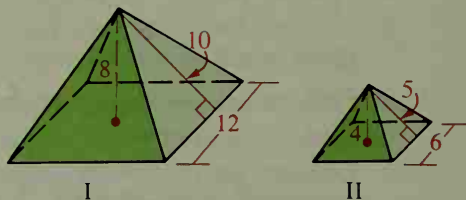
Right cylinders



The bases are similar because all circles are similar. The lengths are proportional because $\frac{6}{4} = \frac{12}{8}$.

So the solids are similar with scale factor $\frac{3}{2}$.

Regular square pyramids



The bases are similar because all squares are similar. The lengths are proportional because $\frac{12}{6} = \frac{8}{4} = \frac{10}{5}$.

So the solids are similar with scale factor $\frac{2}{1}$.