7.2 Similar Solids and Ratios

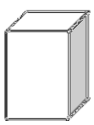
- Two solids are **isometric** if all corresponding angles and edges are congruent.
- Two solids are **similar** if all corresponding angles are congruent, and corresponding edges are proportional.
- Recall:
  - If the ratio between 2 similar solids is k ($\frac{s\prime}{s} = k$)
  - Then the ratio of Areas is k^2 ($\frac{A\prime}{A} = (\frac{s\prime}{s})^2 = k^2$)
  - And the ratio of Volumes is k^3 ($\frac{V\prime}{V} = (\frac{s\prime}{s})^3 = k^3$)

Steps to solve a problem:

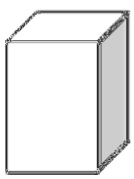
- First step is: find k then find k^2 and/or k^3
- to find a missing side:
  - write the ratio of sides = k ; then cross multiply
- to find a missing area:
  - write the ratio of areas = k^2 ; then cross multiply
- to find a missing volume:
  - write the ratio of volumes = k^3 ;then cross multiply
- **Note:** Keep the image always on top in your ratios

Ex 1: find the volume of the bigger prism

K = $\frac{3}{2}$



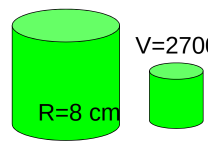
V = 16 cm^3



V = ?

K (sides)	k^2 (areas)	k^3 (volumes)
$\frac{3}{2}$ (given)	$\frac{9}{4}$	$\frac{27}{8}$

Ex 2: Determine the area of the base of the small cylinder if the two cylinders are similar.



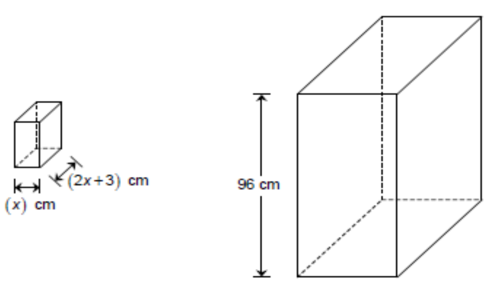
V=27000π cm^3

V=64000π cm^3

Shown below are two similar right prisms, each with a rectangular base.

The lengths, in centimetres, of the sides of the base of the smaller prism can be represented by the monomial (x) and the binomial $(2x+3)$ respectively. In this case, the volume of the smaller prism, in cm^3, is represented by the polynomial $(6x^3+9x^2)$.

The height of the larger prism is 96 cm. The total area of the larger prism is 64 times the area of the smaller prism.



What is the numerical volume of the larger prism?

Practice:
p. 221 # 1,2
p.222 # 10-15