REVIEWING CHANGES IN PERIMETER, AREA, OR VOLUME
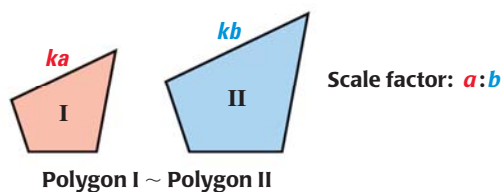
For two similar polygons or similar solids, the ratio of the lengths of corresponding sides or edges, respectively, is called the *scale factor*. Scale factors are written as $a:b$, or $\frac{a}{b}$.
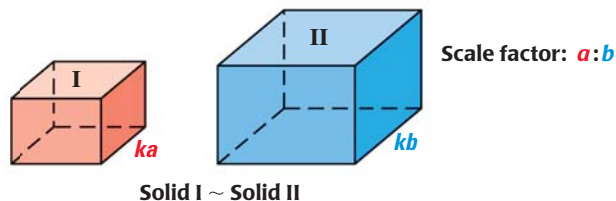
SIMILAR POLYGONS

Polygon I ~ Polygon II

Ratio of the corresponding side lengths: $a:b$
Ratio of the perimeters: $a:b$
Ratio of the areas: $a^2:b^2$

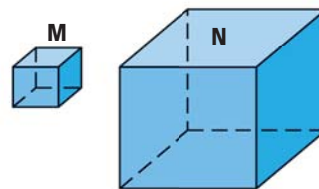### SIMILAR SOLIDS

Solid I ~ Solid II

Ratio of the corresponding edge lengths: $a:b$
Ratio of the surface areas: $a^2:b^2$
Ratio of the volumes: $a^3:b^3$

EXAMPLE

The prisms are similar with a scale factor of $1:3$. Find the volume of prism N given that the volume of prism M is 24 cubic inches.

$\dfrac{\text{Volume of M}}{\text{Volume of N}} = \dfrac{a^3}{b^3}$ **Write proportion.**

$\dfrac{24}{\text{Volume of N}} = \dfrac{1^3}{3^3}$ **Substitute.**

Volume of N = 24 · 27   **Cross multiply.**

Volume of N = 648   **Simplify.**

▶ The volume of prism N is 648 cubic inches.