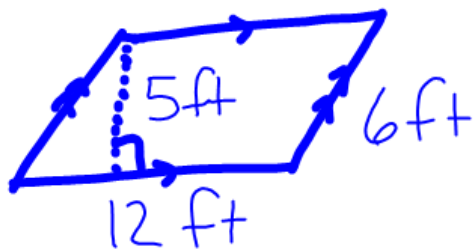


# Warm-up

Find area of each.

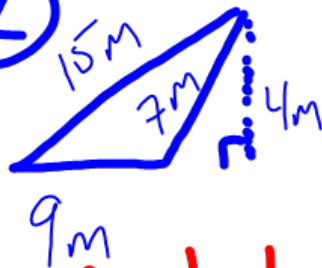
①



$$A = b \cdot h$$

$$A = 12 \cdot 5 = 60 \text{ ft}^2$$

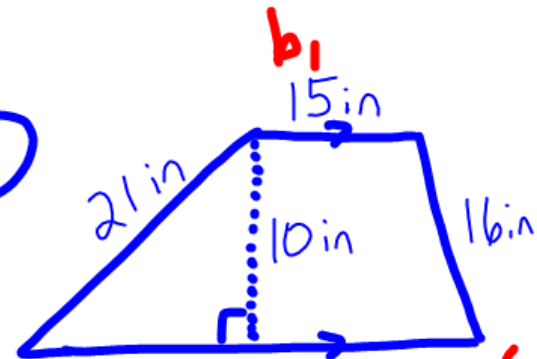
②



$$A = \frac{b \cdot h}{2}$$

$$A = \frac{9 \cdot 4}{2} = 18 \text{ m}^2$$

③

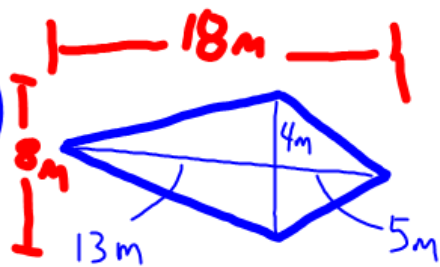


$$A = \frac{1}{2} h (b_1 + b_2)$$

$$A = \frac{1}{2} (10)(30 + 15) = (5)(45) = 225 \text{ in}^2$$

$$\begin{array}{r} 40 \\ \times 5 \\ \hline 200 \end{array} \quad \begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$$

④



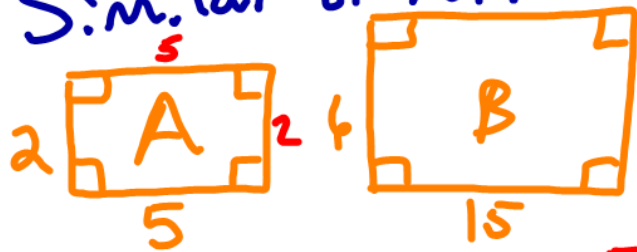
$$A = \frac{1}{2} d_1 \cdot d_2$$

$$A = \frac{1}{2} (8)(18) = (8)(9)$$

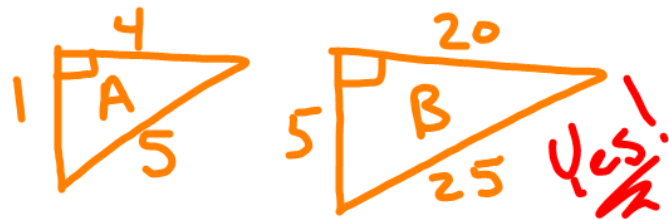
$$= 72 \text{ m}^2$$

# 11.3 Area/Perimeter of Similar Figures

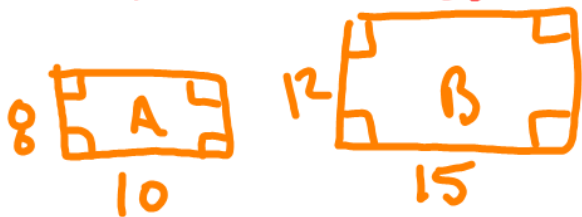
Similar or not?



\*Check ratio  $\frac{2}{6} = \frac{1}{3}$   $\frac{5}{15} = \frac{1}{3}$   
Yes!



Ratio:  $\frac{1}{5}$   $\frac{4}{20} = \frac{1}{5}$   $\frac{5}{25} = \frac{1}{5}$   
Yes!



$\frac{8}{12} = \frac{2}{3}$   $\frac{10}{15} = \frac{2}{3}$

Perimeter

<u>A</u>	<u>B</u>
14	42

Ratio =  $\frac{14}{42} = \frac{1}{3}$   
\*Same as sides!

<u>A</u>	<u>B</u>
10	50

Ratio =  $\frac{10}{50} = \frac{1}{5}$   
\*Same as sides!

<u>A</u>	<u>B</u>
----------	----------

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

Area

<u>A</u>	<u>B</u>
10	90

Ratio =  $\frac{10}{90} = \frac{1}{9} = \left(\frac{1}{3}\right)^2$

<u>A</u>	<u>B</u>
2	50

$\frac{2}{50} = \frac{1}{25} = \left(\frac{1}{5}\right)^2$

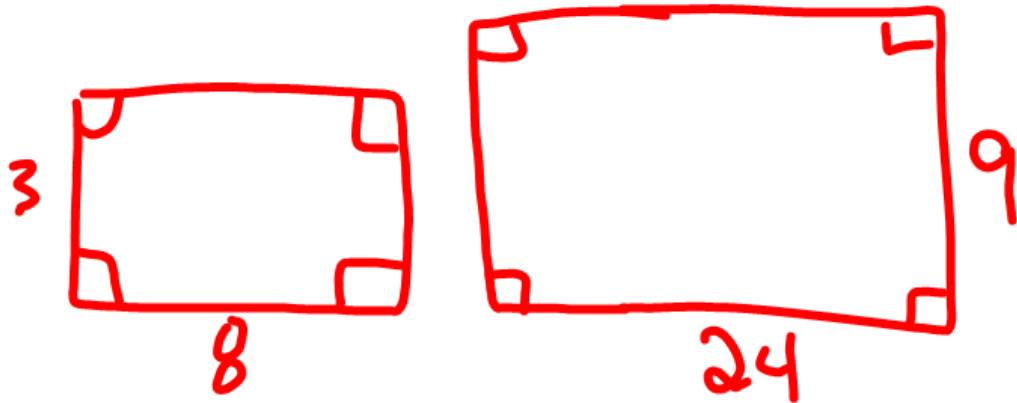
<u>A</u>	<u>B</u>
----------	----------

$\frac{2}{3} \cdot \frac{2}{3} = \frac{4}{9}$   
 $= \frac{4}{9}$  or  $\left(\frac{2}{3}\right)^2$

# Warm-up

Similar or not?

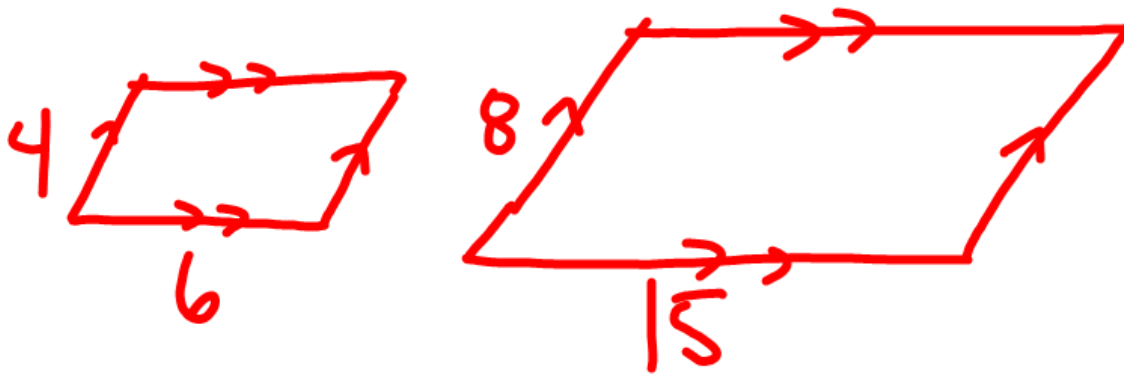
①



$$\frac{3}{9} = \frac{8}{24} = \frac{1}{3}$$

Yes!  
Similar

②



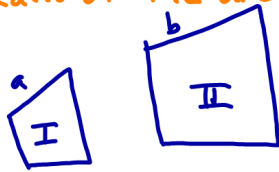
$$\frac{4}{8} = \frac{6}{15} = \frac{2}{5}$$

$$\frac{1}{2} \neq \frac{2}{5}$$

Not Similar !!

\* Ratio of sides = ratio of the perimeters

\* Ratio of the areas = Square of the sides' ratio



So  $\frac{a}{b} = \frac{\text{perimeter of I}}{\text{perimeter of II}}$

$$\frac{\text{Area I}}{\text{Area II}} = \frac{a^2}{b^2}$$

Example

Are similar... find:



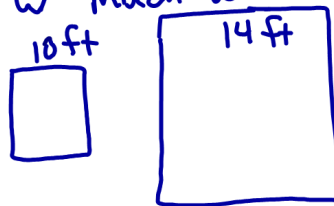
① Ratio of perimeters (I to II)  $\rightarrow \frac{I}{II}$

$$\frac{8}{12} \rightarrow \frac{4}{6} \rightarrow \boxed{\frac{2}{3}}$$

② Ratio of areas (I to II)

$$\left(\frac{2}{3}\right)^2 \text{ or } \left(\frac{2}{3}\right)\left(\frac{2}{3}\right) \rightarrow \frac{4}{9}$$

② Replace carpet in my and Mohan's Rooms. Are similar. My room costs \$225. How much will his cost?



\* Deal with area...

ratio:  $\frac{10}{14} \rightarrow \frac{5}{7}$

use  $\left(\frac{5}{7}\right)\left(\frac{5}{7}\right) = \boxed{\frac{25}{49}}$   
Want  $\uparrow$

So  $\frac{\text{Miller}}{\text{Mohan}} \frac{25}{49} = \frac{225}{M}$

Cross-multiply

$$25M = 11025$$

$X = \$441$