

# Chapter 11: Similarity

## Proportionality

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \underline{\quad} = \underline{\quad} = \underline{\quad}$$

- Are the following proportional?
- 1)  $\frac{4}{6} = \frac{8}{12}$       2)  $\frac{5}{6} = \frac{29}{30}$       3)  $\frac{10}{90} = \frac{1}{9}$       4)  $\frac{4}{60} = \frac{2}{30}$

If you obtain  $\frac{18}{25}$  on a test, what is the percentage?

Find the value of  $x$  if both fractions are proportional.

1.)  $\frac{x}{6} = \frac{8}{12}$       2.)  $\frac{4}{2x} = \frac{8}{9}$       3.)  $\frac{x+1}{30} = \frac{40}{100}$

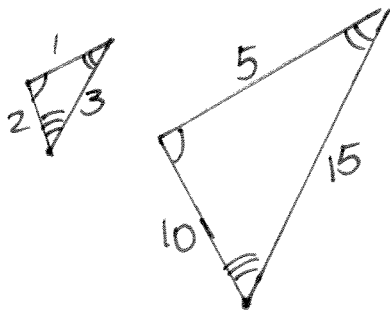
4.)  $\frac{120}{500} = \frac{3x}{2x-6}$

5.)  $\frac{x}{5} = \frac{40}{10x}$

# Similar Figures

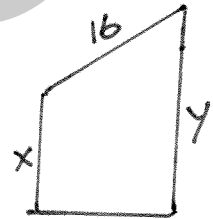
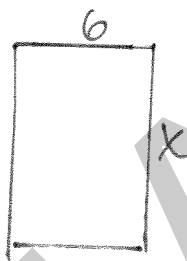
TWO figures are similar when:

- 1) the corresponding angles are equal.
- 2) the corresponding are proportional.



$k$  = ratio of similarity  
(scale factor)

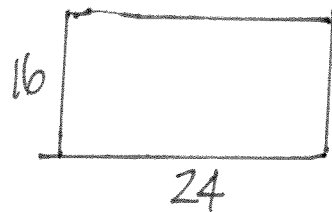
Find the missing side



RATIOS



$P =$   
 $A =$   
 $V =$



$P =$   
 $A =$   
 $V =$

Scale factor =  $k =$

$$\frac{\text{Big}}{\text{small}} =$$

$$\frac{\text{Small}}{\text{Big}} =$$

Ratio  
OF  
Perimeters

$$= \frac{P_{\text{small}}}{P_{\text{Big}}} =$$

Ratio  
OF  
Areas

$$= \frac{A_{\text{small}}}{A_{\text{Big}}} =$$

Ratio  
OF  
Volumes

$$\frac{V_{\text{small}}}{V_{\text{Big}}} =$$

$k$	$k^2$	$k^3$
3		
$\frac{1}{2}$		
5		
$\frac{3}{4}$		
$\frac{5}{7}$		
$\frac{1}{4}$		
	16	
	$\frac{1}{25}$	
	$\frac{49}{64}$	
	$\frac{1}{81}$	
		$\frac{1}{216}$
		$\frac{8}{27}$
		$\frac{1}{1000}$
		$\frac{64}{729}$
		$\frac{1}{125}$

$$K = \frac{S_1}{S_2}$$

$$K^2 = \frac{A_1}{A_2}$$

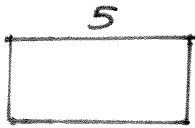
$$K^3 = \frac{V_1}{V_2}$$

K

K<sup>2</sup>

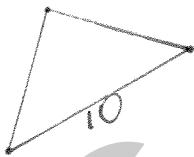
K<sup>3</sup>

1. If objects are similar, find x.



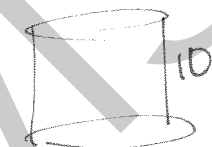
$$\frac{V_1}{V_2} = \frac{8}{343}$$

2.



$$\frac{V_1}{V_2} = ?$$

3.



$$V = 1000 \text{ cm}^3$$



$$V = 343 \text{ cm}^3$$

Find x.

4) If the ratio of areas is  $49/81$ , find the side  $x$ .



5)  $\frac{A_1}{A_2} = \frac{144}{125}$        $\frac{V_1}{V_2} = ?$

6) Simplify  $\frac{1.2}{8.4}$

7) In these similar prisms, the ratio of volumes is  $\frac{1000}{1331}$ . Find  $x$ .



8) A perfume costs 20\$ for a 6cm high bottle. Find the cost for a 12cm high bottle.

9) A carpet costs 150\$ for a 10m by 6m size. Find the cost for a 5m by 2m.

10) A square floor 30m by 30m costs 1500\$ to tile. Find the cost of tiling 60 by 60m floor.