

BE - Geometry | TUESDAY 10-26-10

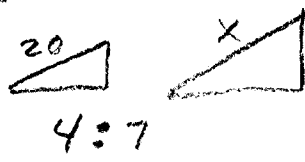
ACT  
PRACTICE

① The lengths of the corresponding sides of 2 similar right triangles are in the ratio of 4:7. The hypotenuse of the smaller triangle is 20 in. How long is the hypotenuse of the larger triangle (inches).


②  $-6 \mid -10 + 11 \mid$

③ Find the surface area of a cube with each side equal to 7m.

ANS

①   $\frac{20}{x} = \frac{4}{7}$   $4x = 140$   
 $x = 35 \text{ in}$

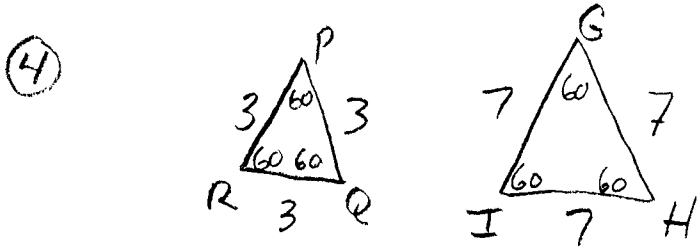
②  $-6 \mid 1 \mid = -6$

③   $\Rightarrow 49 \text{ m}^2 \text{ per side}$   
 $\times 6$   
 $294 \text{ m}^2$

Homework Review Page 293 # 3-9

③ If 2 polygons are congruent, they are also similar because the corresponding  $\angle$ s are  $\cong$  and the sides are in a 1:1 proportion since they are congruent.

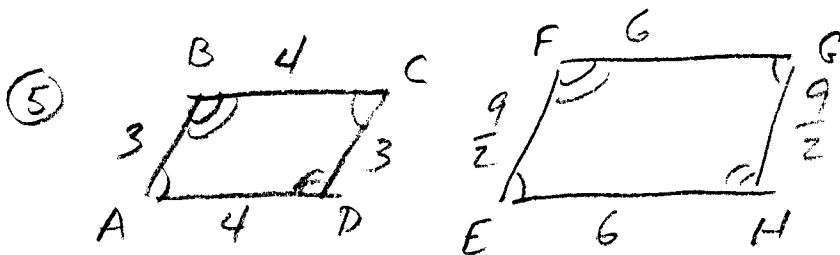
Two similar polygons are only congruent if the sides are in a 1:1 proportion.



$\triangle PQR \sim \triangle GHI$  Because both are  $\triangle$

$\therefore \angle P \cong \angle G, \angle R \cong \angle I, \angle Q \cong \angle H$

And all sides are  $\frac{3}{7} = \frac{PQ}{GH} = \frac{PR}{GI} = \frac{RQ}{IH}$



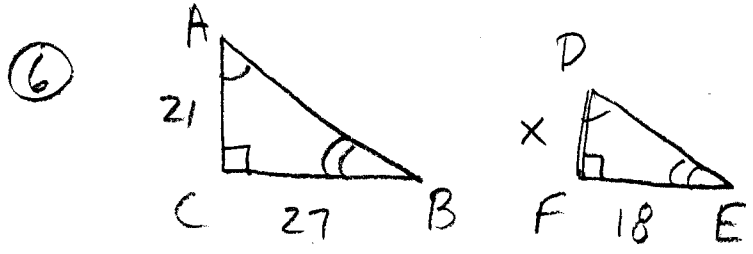
$\frac{4}{6} \stackrel{?}{=} \frac{3}{\frac{9}{2}}$

$18 = 4 \cdot \frac{9}{2} \checkmark$

All sides are in proportion, the scale factor is  $\frac{2}{3}$

All corr.  $\angle$ s  $\cong$

$\therefore \triangle ABCD \sim \triangle EFGH$



$\Delta ACB \sim \Delta DFE$

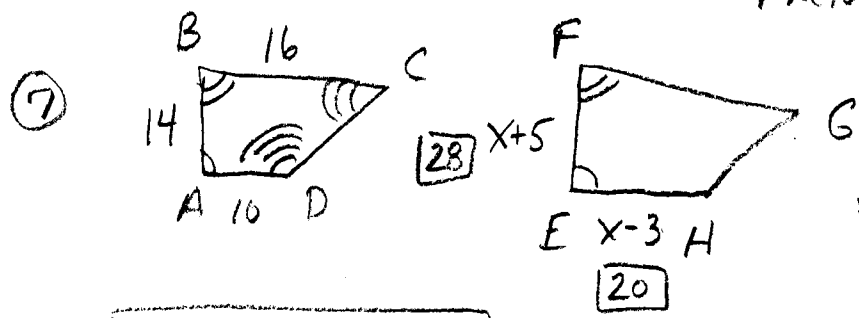
$\frac{21}{x} = \frac{27}{18}$

$\frac{21}{x} = \frac{3}{2}$

SCALE FACTOR

$\therefore 3x = 42$

$x = 14$



$ABCD \sim EFGH$

REDRAW & LABEL

$\frac{14}{x+5} = \frac{10}{x-3}$

$\therefore 10x + 50 = 14x - 42$   
 $-10x \quad -10x$

$92 = 4x$

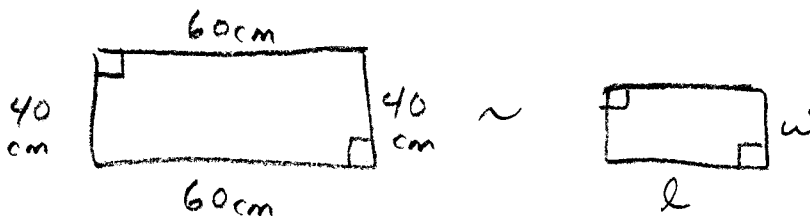
$23 = x$

$\therefore \overline{FE} = 28$   
 $\overline{EH} = 20$

$\therefore$  SCALE FACTOR IS  $\frac{10}{20} = \frac{1}{2}$

$\therefore \frac{16}{FG} = \frac{1}{2} \therefore \overline{FG} = 32$

⑧



$$\text{SCALE FACTOR IS } \frac{1}{4} = \frac{\text{SMALL}}{\text{LARGE}}$$

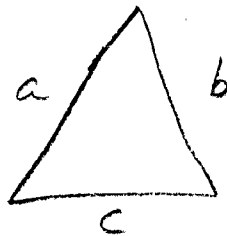
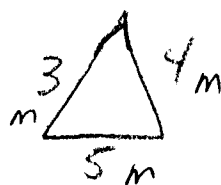
$$\therefore \frac{w}{40} = \frac{1}{4} \quad \therefore 4w = 40 \quad \boxed{w = 10 \text{ cm}}$$

↑  
UNITS!

$$\frac{l}{60} = \frac{1}{4} \quad \therefore 4l = 60 \quad \boxed{l = 15 \text{ cm}}$$

↑  
UNITS!

⑨



$$\text{SCALE FACTOR IS } \frac{5}{1} \frac{\text{LARGE}}{\text{SMALL}} \quad \therefore \frac{5}{1} = \frac{a}{3}$$

$$a = 15 \text{ m}$$

$$b = 20 \text{ m}$$

$$c = 25 \text{ m}$$

$$P = 15 + 20 + 25$$

$$\boxed{P = 60 \text{ m}}$$

## Ch. 6-3 Similar Triangles

How to identify similar  $\Delta$ 's

AA  $\Rightarrow$  "2  $\angle$ s gets you 3" so this is really AAA in disguise

If 2  $\angle$ s of one  $\Delta$  are  $\cong$  to 2  $\angle$ s of another  $\Delta$ , the  $\Delta$ 's are similar.

SSS In Proportion  $\Rightarrow$  If all 3 pairs of corresponding sides are in proportion, the  $\Delta$ 's are similar.

(summary 3  $\angle$ s  $\cong$  of 3 pairs of sides in proportion)

Finally:

SAS  $\Rightarrow$  Two sides in proportion and the included angle  $\cong$ ,  $\Delta$ 's are similar.

# Ch 7-1 Geometric Mean

NOTE: ARITHMETIC Mean is full name for "Average"

Recall:  $\frac{a}{b} = \frac{c}{d}$       $a, d = \text{EXTREMES}$   
 $\phantom{\text{Recall: }} \phantom{\frac{a}{b} = \frac{c}{d}} \phantom{a, d = \text{EXTREMES}} \phantom{b, c = \text{MEANS}}$

The cross-products are equal  
 $ad = bc$

∴ The product of the means equals the product of the extremes.

## Geometric Means

For any 2 positive numbers  $a, b$ , the geometric mean is the positive number  $x$  where

$$\frac{a}{x} = \frac{x}{b} \text{ is true.}$$

$$\therefore x^2 = ab$$

$$\therefore x = \sqrt{ab}$$

$x = \pm \sqrt{ab}$   
BUT THE  
NEGATIVE PART IS  
NOT USED.

EX 1  
Pg 342

A. Find geometric mean between 4 and 9

$$\frac{4}{x} = \frac{x}{9} \quad x^2 = 36 \quad \therefore \boxed{x = 6}$$

⑥ Find geometric mean between  
6 and 15

$$\frac{6}{x} = \frac{x}{15} \quad \therefore x^2 = 90$$

$$x = \sqrt{90}$$

9 10

$$\boxed{x = 3\sqrt{10}} \quad x \approx 9.49$$

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Homework: Pg 301 # 5-8

Pg 345 # 4-7