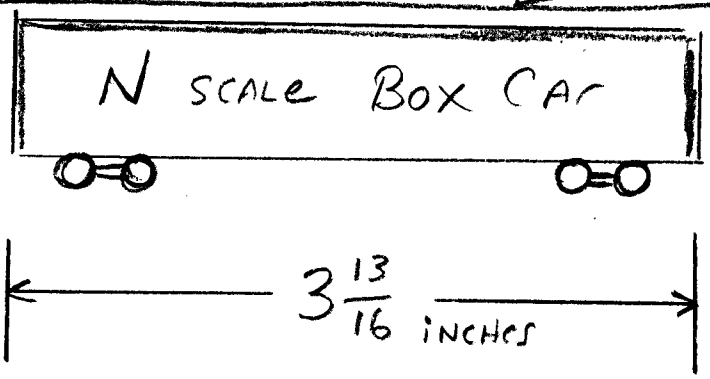
BE-Geometry 11 - Monday 10-25-10



① What do you need to know to find the length of the real box car in feet?

Ans

N Scale is 1:160

There are 12 in per ft

---

② Find the length of the real car.

Ans

$$\frac{\frac{61}{16}\text{ in}}{12\ \frac{\text{in}}{\text{ft}}} = \frac{61}{(16\cdot 12)}\text{ ft}$$

$$\left(\frac{\text{model}}{\text{real}}\right)\ \frac{1}{160} = \frac{\frac{61}{(16\cdot 12)}}{l}$$

SCALE FACTOR

$$\therefore\ l = \frac{\cancel{160}^{10}}{1}\cdot\frac{61}{\cancel{16}\cdot 12} = \frac{\cancel{10}^{5}\cdot 61}{\cancel{12}_{6}} = \frac{305}{6}$$

$$6\overline{)305.00}\quad 50.83$$

$$= \boxed{50.83\text{ ft}}$$

POLYGON — A CLOSED FIGURE formed by COPLANAR LINE SEGMENTS (SAME PLANE = SAME FLAT SURFACE)

many angle "gonu" Greek for Knee

⇒ line segments are called SIDES

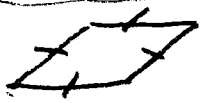
⇒ line segments meet at points called VERTICES

etc...

	1 NA	7 heptagon	N-gon
	2 NA	8 octagon	
*(trigon)	3 triangle	9 nonagon	
*(tetragon)	4 quadrilateral	10 decagon	
	5 pentagon	11 hendecagon	
	6 hexagon	12 dodecagon	

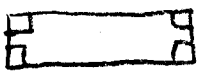
Types of Polygons

4 sides example

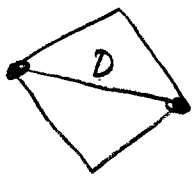


Equilateral — All sides ≅

Equiangular — All ∠s ≅

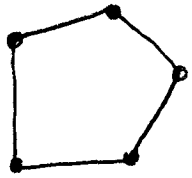


Regular — All sides and ∠s ≅

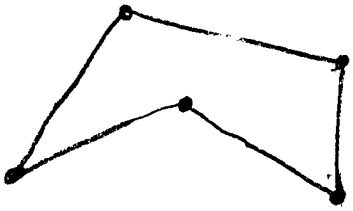


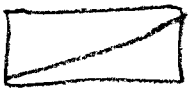
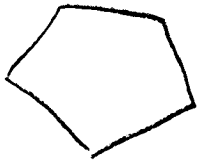
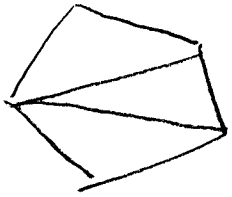
D = diagonal connect 2 non-adjacent vertices

CONVEX POLYGONS — EACH INTERIOR ∠ IS LESS THAN 180°



CONCAVE POLYGONS — AT LEAST ONE ANGLE IS > 180°
(a side "CAVES IN")



SIDES		NUMBER OF △'S	SUM OF ∠S
3		1	180
4		 2	360
5		 3	540
6		 4	720
⋮			⋮
n			n

Ch. 6-2 Similar Polygons

Two polygons are similar iff their corresponding $\angle$s are $\cong$ and the measures of the sides are in proportion.

(have the same scale factor)

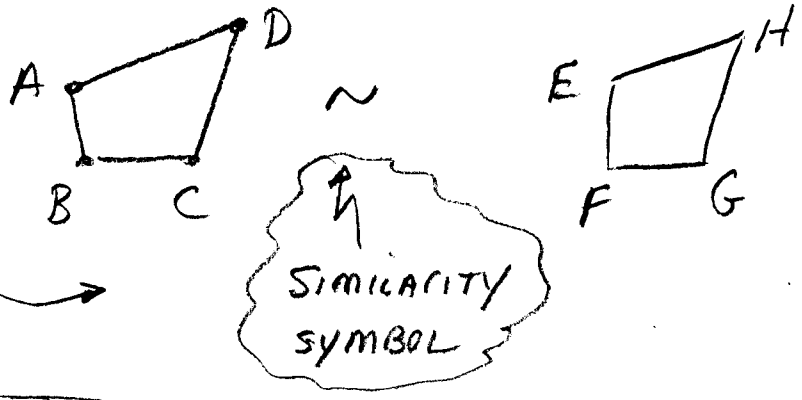
This is: you get similar polygons when you shrink or enlarge them on a copier.

---

* The order of the vertices is important.

(EX) Pg 289

IF you label this way



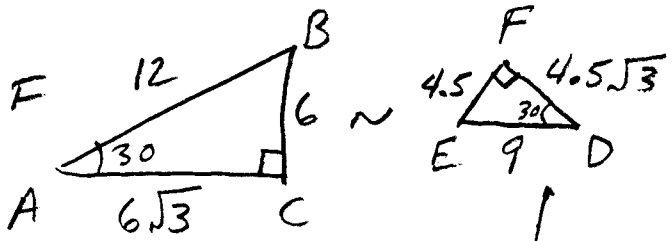
$ABCD \sim EFGH$ means $\angle A \cong \angle E$
$\angle B \cong \angle F$
$\angle C \cong \angle H$
$\angle D \cong \angle G$

Note = signs $\Rightarrow$ AND $\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{DA}{HE}$

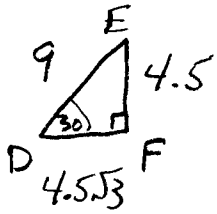
JUST LIKE WHEN determining $\cong$, WHEN determining WHETHER POLYGONS ARE $\sim$ you have to be careful to compare corresponding sides AND corresponding angles

For $\cong$	For $\sim$
$\angle s \cong \angle s$	$\angle s \cong \angle s$
SIDES $\cong$ SIDE	SIDES (ARE PROPORTIONAL) SIDES

EX 1 pg 290 SHOW IF



$\sim$



Check $\angle s \cong$

$m\angle A = 30°, \angle A \cong \angle D$, $m\angle F = 90° \angle C \cong \angle F$, $m\angle B = 60°$ ✓
$\angle B \cong \angle E$

Check SIDES IN proportion

$\frac{AB}{DE} = \frac{12}{9} \stackrel{?}{=} \frac{BC}{EF} = \frac{6}{4.5}$ $\quad 6 \cdot 9 \stackrel{?}{=} 12(4.5)$ ✓

$\frac{12}{9} \stackrel{?}{=} \frac{AC}{DF} = \frac{6\sqrt{3}}{4.5\sqrt{3}}$ ✓

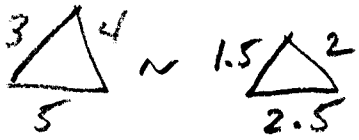
SCALE FACTOR $= \frac{12}{9} = \frac{4}{3}$

$\triangle$'S ARE SIMILAR

$\triangle ABC \sim \triangle DEF$

WHEN USING THE SCALE FACTOR BETWEEN 2 POLYGONS – use it "in the same direction" EACH time:

(EX) SCALE FACTOR IS $\frac{2}{1}$ (→) or $\frac{1}{2}$ (←)



SCALE FACTOR IS THE RATIO OF THE LENGTHS OF ANY TWO CORRESPONDING SIDES.

* WATCH OUT *

MAKE SURE UNITS ARE CONSISTENT &

* INCLUDE UNITS *

(EX4) $\triangle ABC$ is $\sim \triangle XYZ$, SCALE FACTOR is $\frac{2}{3}$

IF $\triangle ABC$ SIDES ARE 6, 8, 10 inches,

FIND $\triangle XYZ$ SIDES

$\frac{A}{X} = \frac{2}{3}$ ∴ $\frac{6}{x} = \frac{2}{3}$ ∴ $x = 9$ IN

$\frac{B}{Y} = \frac{2}{3}$ ∴ $\frac{8}{y} = \frac{2}{3}$ ∴ $y = 12$ IN

$\frac{C}{Z} = \frac{2}{3}$ ∴ $\frac{10}{z} = \frac{2}{3}$ ∴ $z = 15$ IN

Homework: Pg 293 # 3–9