KEY

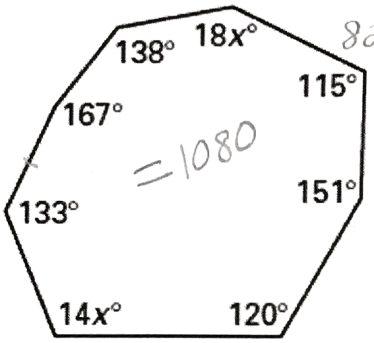
Geometry Review Sheet for Unit 4/5 Test: Polygons and Similarity.

	Sum	Each Angle
Interior	$180(n-2)$	$\frac{180(n-2)}{n}$
Exterior	360	$\frac{360}{n}$

Only used when the polygon is Regular

1)

a) Find the value of x.



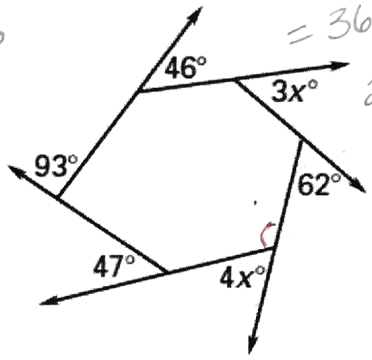
$n=8$

$824 + 32x = 1080$

$32x = 256$

$x = 8$

b) Find the value of x.



$= 360$

$248 + 7x = 360$

$7x = 112$

$x = 16$

2) Find the measure of an interior angle and an exterior angle of the regular polygon given below:

A. Regular octagon — Int $\frac{180(n-2)}{n}$, Ext $\frac{360}{n}$, $n=8$, I 135 / E 45

B. Regular 16-gon — $n=16$, E 157.5 / E 22.5

3) A regular polygon has an exterior angle measure of $(8x+4)°$ and an adjacent interior angle measure of $(42x-24)°$.

A. Find the measure of each angle. I/E 144/36

B. How many sides does this polygon have? $\frac{360}{n} = 36$, $n=10$

$8x + 4 + 42x - 24 = 180$

$50x - 20 = 180$

$x = 4$

4) Explain the difference between irregular and regular polygons.

Regular = all sides $\cong$ all $\angle$'s $\cong$

IRRegular = all $\angle$'s & sides are not $\cong$

5) Complete the chart.

Classification	# Sides	Sum of Interior Angles
nonagon	9	1260
14-gon	14	2160
decagon	10	1440
26-gon	26	4320

6)

a) Determine the smallest degree of rotation that will carry the regular decagon onto itself.

36°

$\frac{360}{n} \Leftrightarrow \frac{360}{10}$

$n=10$

b) Determine the degrees of rotation that will carry the regular figure onto itself.

$\frac{360}{3}$

$n=3$

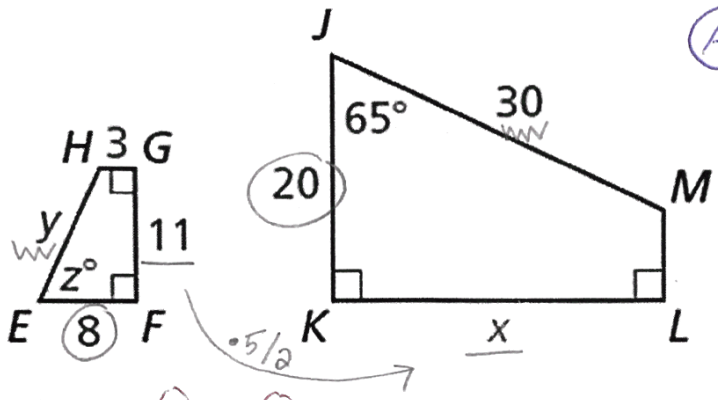
multiples of 120

120, 240, 360

7)

a) For two figures to be similar, the corresponding **angles** must be $\cong$ "matching" congruent, and the corresponding **side lengths** must be in proportion. $\frac{a}{b} = \frac{c}{d}$

b) For two figures to be congruent, the corresponding **angles** must be congruent, and the corresponding **side lengths** must be congruent.



(A) 8 : 20 ÷4 → 2 : 5 ÷4

In the figure HGFE ~ MLKJ

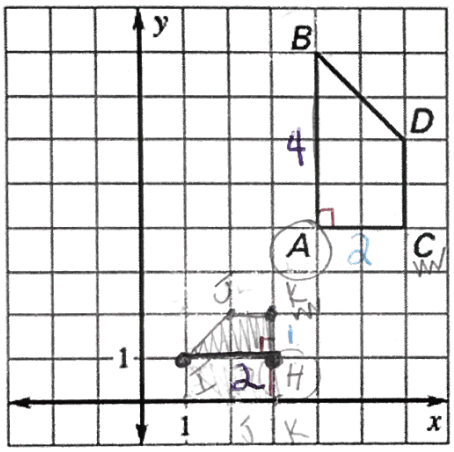
4 4

$\frac{x}{11} = \frac{20}{8}$

A. Find the scale factor of HGFE to MLKJ. 2 : 5
B. Find the scale factor of MLKJ to HGFE. 5 : 2
C. Find the value of *x*. 27.5
D. Find the value of y. 12
E. Find the value *z*. 65°

$\frac{y}{30} = \frac{8}{20}$

9)



$\frac{HI}{AB} = SF$

$\frac{2}{4} = \boxed{\frac{1}{2}}$

HI matched AB

OLD NEW

Suppose that ABDC is similar to polygon HIJK after a dilation of ABDC. H is at (3,1) and I is at (1,1).

Part A: What is the scale factor between the two polygons? $\frac{1}{2}$ $\frac{HI}{AB} = \frac{2}{4} = \frac{1}{2}$

Part B: What are the coordinates of K? (3,2) or (3,0)

Part C: What is the relationship between the areas of the two ~~triangles~~ polygons? $1^2 : 2^2$ $\boxed{1 : 4}$

10) A rectangle has side lengths of 10 and 14. A similar rectangle might have side lengths of :

A. 11 and 14
B. 15 and 21
C. 9 and 18
D. 16 and 20

A) $\frac{10}{11} \neq \frac{14}{14}$

B) $\frac{10}{15} = \frac{14}{21}$ ✓ $\frac{2}{3} = \frac{2}{3}$

C) $\frac{10}{9} \neq \frac{14}{18}$ $\frac{10}{9} \neq \frac{7}{9}$

D) $\frac{10}{16} \neq \frac{14}{20}$ $\frac{5}{8} \neq \frac{7}{10}$

see which sides would be in proportion

Poster 35 | copy 8 | 10

try Review Sheet for Unit 4/5 Test: Polygons and Similarity.

You are printing posters for a concert and need them to be 35'' tall. The small copy you have is 8'' wide by 10'' inches tall.

Part A: What scale factor you should use to enlarge the image and make sure the posters are proportional?

$k = \frac{35}{10} = \frac{7}{2}$ or 3.5

Poster : new / copy : old

Part B: How wide will the enlarged poster be?

old · k = new

$8 \cdot 3.5 = 28$ 28''

$\frac{8}{x} = \frac{10}{35}$

Part C: What relationship (ratio) do the areas of the small copy and the poster have?

49 : 4

$7^2 : 2^2$ ↑ sides²

12) Two polygons are similar with a scale factor of 5 to 7. The area of the smaller polygon is 60 in². What is the area of the larger polygon?

Relationship b/w sides and area: $\frac{\text{side}^2}{\text{side}^2} = \frac{A}{A}$

△ 5 ~ △ 7

$A = 60$ $A = x$

side²:side²

$\frac{5^2}{7^2} = \frac{60}{x}$

$\frac{25}{49} = \frac{60}{x}$ $x = 117.6$

13) The areas of two similar polygons are in the ratio 25:81. Find the ratio of the corresponding sides.

5:9

14) In table tennis, the table is a rectangle 9 feet long and 5 feet wide. A tennis court is a rectangle 78 feet long and 36 feet wide. Are the two surfaces similar? Explain. If so, find the scale factor of the tennis court to the table.

TABLE 5 / 9 Tennis 36 / 78

$\frac{5}{36} \neq \frac{9}{78}$ not ~

.14 ≠ .11

15) Quadrilateral $HALK$ is congruent to quadrilateral $FORT$. $m\angle H = 60°$, $m\angle L = 152°$, and $m\angle T = 42°$. What is $m\angle A$?

H 60 K 42 152 A L F 60 T 42 52 O R

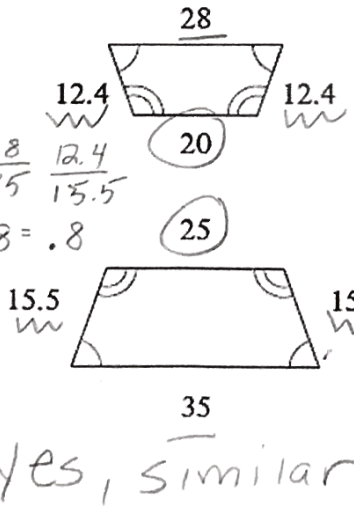
360 − (60 + 42 + 152) = 106

180(4−2) 180(n−2)

16) Which quadrant has two polygons that are similar?

① proportion ② ∠'s ≅

A)

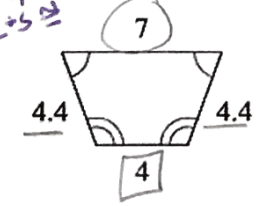


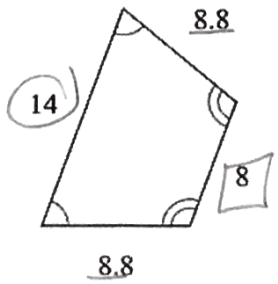
$\frac{20}{25}$ $\frac{28}{35}$ $\frac{12.4}{15.5}$

.8 = .8 = .8

yes, similar

B)





$\frac{7}{14} = \frac{4.4}{8.8} = \frac{4}{8}$

$\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$

yes, similar