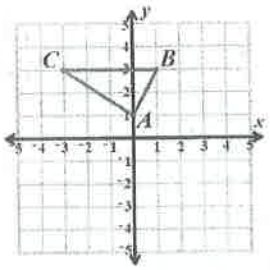
Unit 4 Study Guide Name Key S ____

1) ΔABC is dilated by a scale factor of 3.5, what is the new point of C'?

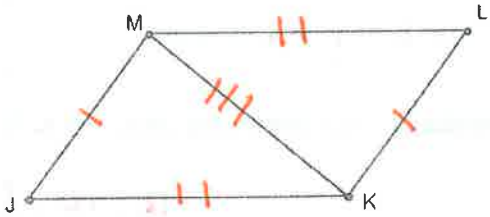


C = (-3, 3) K = 3.5

3.5 (-3, 3)

C' = (-10.5, 10.5)

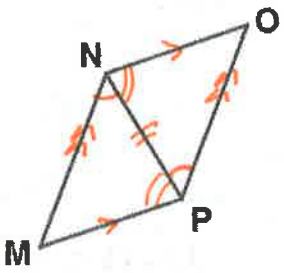
Given: $\overline{MJ} \cong \overline{KL}$, $\overline{ML} \cong \overline{KJ}$, **PROVE** $\measuredangle J \cong \measuredangle L$



	Statements	Reasons
A.	$\overline{MJ} \cong \overline{KL}$	Given
B.	$\overline{ML} \cong \overline{KJ}$	Given
C.	$\overline{MK} \cong \overline{MK}$	Reflexive
D.		
E.	$\measuredangle J \cong \measuredangle L$	CPCTC

3) Given: $\overline{NO} \parallel \overline{MP}$ and $\overline{MN} \parallel \overline{OP}$

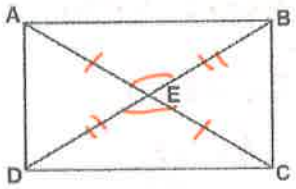
Prove: $\overline{MN} \cong \overline{OP}$



Steps	Statements	Reasons
1	$\overline{NO} \parallel \overline{MP}$ and $\overline{MN} \parallel \overline{OP}$	Given
2	$\angle MNP \cong \angle OPN$	Alt. Int. $\angle$'s
3	$\angle NPM \cong \angle ONP$	Alt. Int. $\angle$'s
4	$\overline{NP} \cong \overline{NP}$	Reflexive
5	$\triangle MNP \cong \triangle OPN$	ASA
6	$\overline{MN} \cong \overline{OP}$	cpctc

4) Given: E is the midpoint of $\overline{AC}$ and $\overline{DB}$

Prove: $\Delta ABE \cong \Delta CED$



Steps	Statements	Reasons
1	E is midpoint of $\overline{AC}$ & $\overline{BD}$	Given
2	$\overline{AE} \cong \overline{EC}$	Def of mid point
3	$\overline{DE} \cong \overline{EB}$	Def of midpoint
4	$\angle AEB \cong \angle CED$	Vertical
5	$\triangle ABE \cong \triangle CED$	SAS

5) ΔDEF and ΔTUV are congruent triangles. Which statement is known to be true?

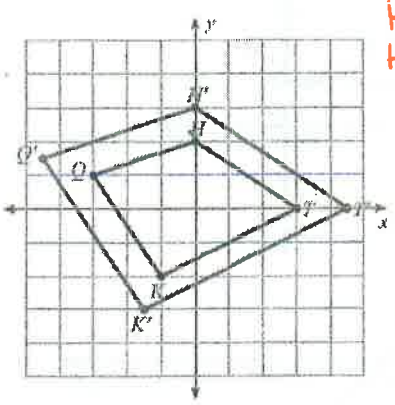
a. $\overline{DE} \cong \overline{TU}$ ✓

c. $\overline{DF} \cong \overline{UV}$ ✗

b. $\overline{DF} \cong \overline{TU}$ ✗

d. $\overline{DE} \cong \overline{TV}$ ✗

6) Determine the dilation scale factor.

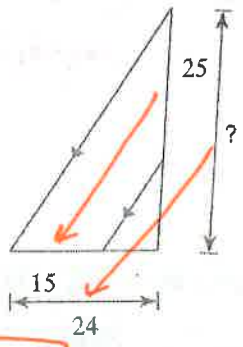


H = (0, 2)
H' = (0, 3)

$K = \frac{\text{new}}{\text{old}} = \frac{3}{2}$

$K = \frac{3}{2}$ or 1.5

7) Find the missing side, ?.



$\frac{25}{15} = \frac{?}{24}$

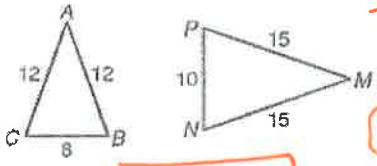
$24 \cdot 25 = 15 \cdot ?$

$\frac{600}{15} = \frac{15?}{15}$

? = 40

Determine if the triangles are similar by AA~, SAS~ or SSS~. Otherwise, write Not Similar. Show your proportions,

8)

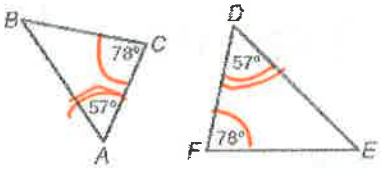


$\frac{12}{15} = \frac{12}{15} = \frac{8}{10}$

.8 = .8 = .8

SSS~

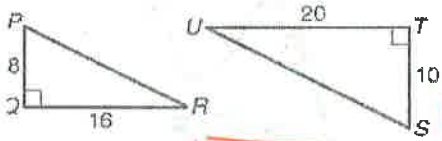
9)



AA~

△ABC ~ △DEF

10)

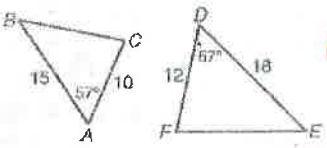


$\frac{8}{10} = \frac{16}{20}$

.8 = .8

SAS~

11)



△ABC ~ △DEF

$\frac{15}{18} = \frac{10}{12}$

$.8\overline{3} = .8\overline{3}$

SAS~

12) If $\overline{DE} = 3x - 15$ *and* $\overline{AC} = 30$, find x.

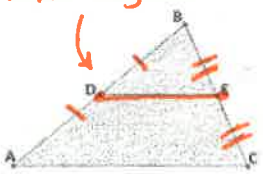
$3x - 15 = \frac{30}{2}$

$3x - 15 = 15$

$3x = 30$

x = 10

mid segment



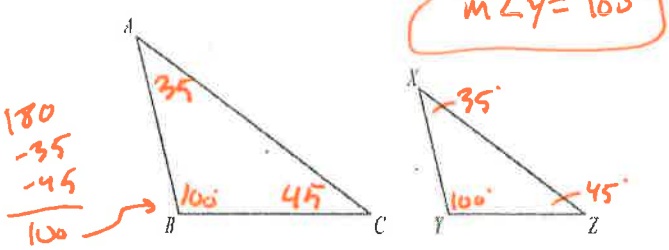
13) Find the length of X.

$\frac{6}{7.5} = \frac{x}{45}$

$\frac{270}{7.5} = \frac{7.5x}{7.5}$

X = 36ft

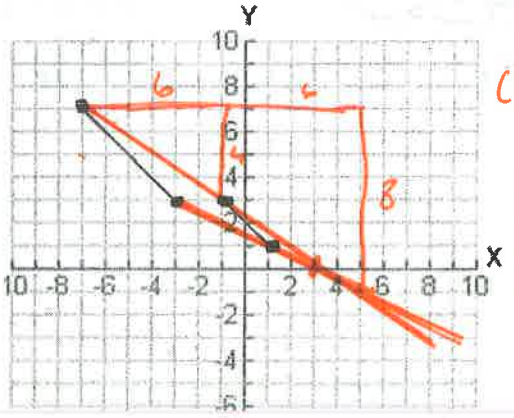
14) In the triangles shown, △ABC is dilated by a factor of $\frac{3}{5}$ to form △XYZ. Given that $m\angle C = 45°$ and $m\angle A = 35°$, what is $m\angle Y$?



180
-35
-45
100

m∠Y = 100°

15) The line on the left was dilated by a scale factor of ½. Approximate the point of dilation.



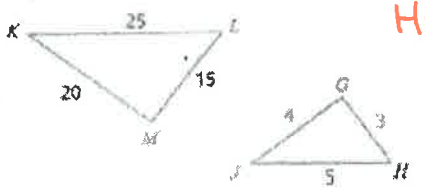
center

(0,0)

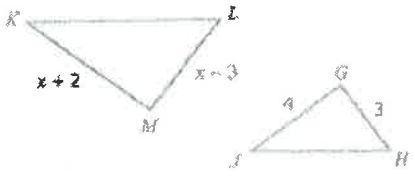
(5, -1)

16) The triangles at the right are similar. Complete the similarity statement using the figures below.

$\Delta LMK \sim \Delta$ HGJ



17) Given $\Delta KLM \sim \Delta JHG$, find x.



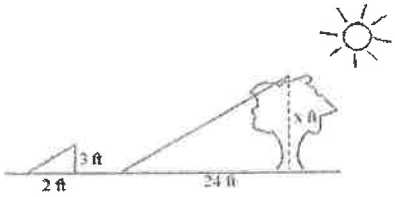
$\frac{x-3}{3} = \frac{x+2}{4}$

$4x - 12 = 3x + 6$

$-3x \quad -3x$

$x = 18$

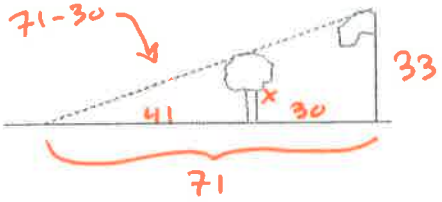
18) If a tree casts a 24-foot shadow at the same time that a yardstick casts a 2-foot shadow, find the height of the tree.



$\frac{2}{3} = \frac{24}{x}$

$x = 36$

19) On level ground, the base of a tree is 30 ft from the bottom of a 33-ft flagpole. The tree is shorter than the pole. At a certain time, their shadows end at the same point 71 ft from the base of the flagpole. How tall is the tree?



$\frac{x}{33} = \frac{41}{71}$

$71x = 1353$

$x = 19.06$ ft

20) If the **area** of a triangle gets smaller from a dilation, write an example of a scale factor that would create this transformation.

k = any # smaller than 1 but bigger than 0

Ex. .3, .5, .9

21) If the **perimeter** of a triangle gets larger from a dilation, write an example of a scale factor that would create this transformation.

k = any # bigger than 1

Ex 1.5, 3, 19, 2.8

22) If a rectangle is dilated by a scale factor of 7 how much larger will the **PERIMETER** of the new shape be when compared to the original?

Perimeter is 1 dimensional so it will be the same scale factor to the power of 1

$k = 7^1 = 7$

so Perimeter is 7 times larger

23) If a rectangle is dilated by a scale factor of 7 how much larger will the **AREA** of the new shape be when compared to the original?

Area is 2 dimensional so it will be the same scale factor to the power of 2

$k = 7^2 = 49$

so Area is 49 times larger