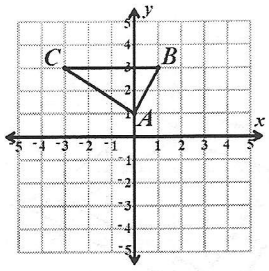
Unit 4 Study Guide – Similarity & Proofs

Name Key S ____

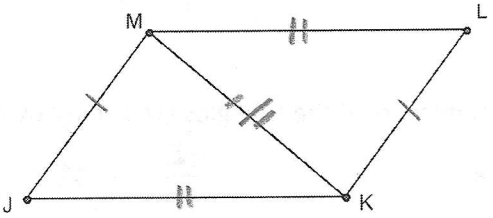
1) ΔABC is dilated by a scale factor of 3.5, what is the new point of C'?



3.5 (3, 3)

C' (10.5, 10.5)

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

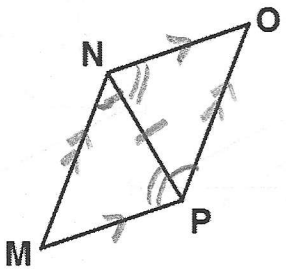


	Statements	Reasons
A.	$\overline{MJ} \cong \overline{KL}$	Given
B.	$\overline{ML} \cong \overline{KJ}$	Given
C.	$\overline{MK} \cong \overline{MK}$	Reflexive
D.	$\Delta JMK \cong \Delta LKM$	SSS
E.	$\measuredangle J \cong \measuredangle L$	CPCTC

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

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

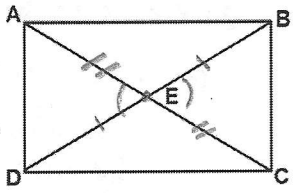
Steps	Statements	Reasons
1	$\overline{NO} \parallel \overline{MP}$ and $\overline{MN} \parallel \overline{OP}$	Given
2	$\angle MNP \cong \angle OPN$	AIA
3	$\angle NPM \cong \angle ONP$	AIA
4	$\overline{NP} \cong \overline{NP}$	Reflexive
5	$\Delta MNP \cong \Delta OPN$	ASA
6	$\overline{MN} \cong \overline{OP}$	CPCTC



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

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

Steps	Statements	Reasons
1	E midpt of AC & DB	Given
2	$\overline{AE} \cong \overline{EC}$	Def of mp
3	$\overline{DE} \cong \overline{EB}$	Def of mp
4	$\angle AEB \cong \angle CED$	Vertical $\measuredangle$'s
5	$\Delta ABE \cong \Delta CED$	



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

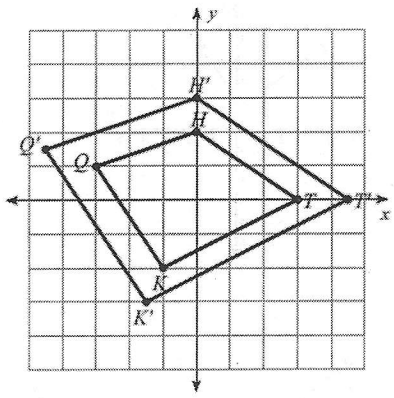
a. $\overline{DE} \cong \overline{TU}$

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

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

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

6) Determine the dilation scale factor.



ΔX

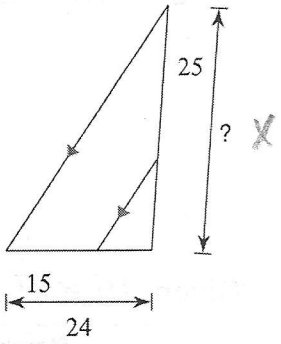
$\frac{T'}{T}$ $\frac{4.5}{3}$ = 1.5

7) Find the missing side, ?.

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

$15x = 600$

$x = 40$



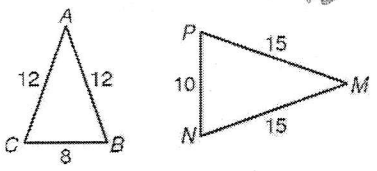
Determine if the triangles are similar by AA~, SAS~ or SSS~. Otherwise, write Not Similar. Show your proportions,

8)

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

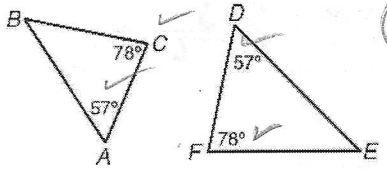
$\frac{4}{5}$

SSS~



9)

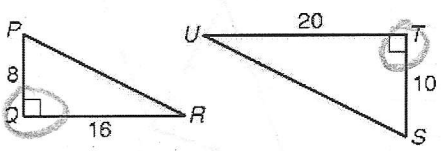
AA~



$\triangle ABC \sim \triangle DEF$

10)

$\frac{8}{10} = \frac{16}{20} = \frac{4}{5}$



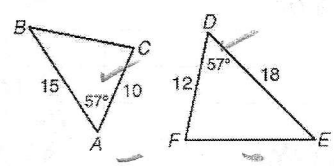
SAS~

11)

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

$\frac{5}{6}$

SAS~



$\triangle ABC \sim \triangle DEF$

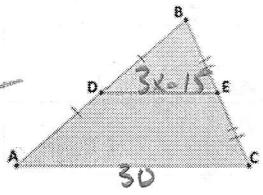
12) If $\overline{DE} = 3x - 15$ *and* $\overline{AC} = 30$, find x.

$2(3x-15) = 30$

$6x - 30 = 30$

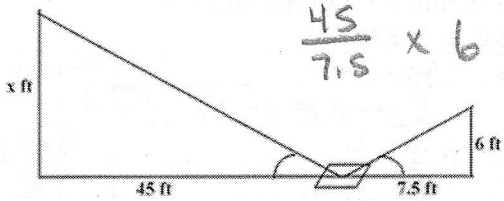
$+30$

$6x = 60$ $x = 10$



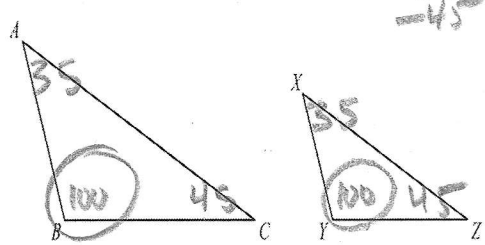
13) Find the length of X.

$\frac{45}{7.5} \times 6 = 36$ ft

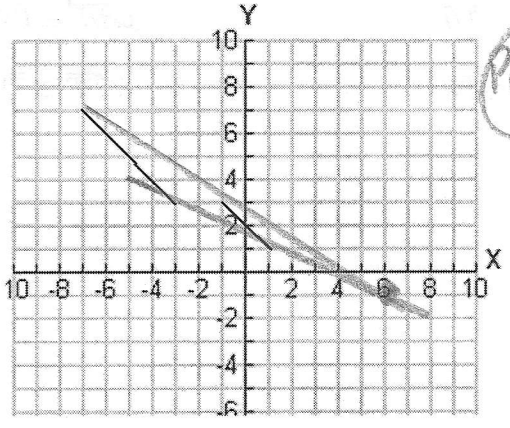


14) In the triangles shown, △ABC is dilated by a factor of $\frac{3}{5}$ to form △XYZ. Given that $m\measuredangle C = 45°$ and $m\measuredangle A = 35°$, what is $m\measuredangle Y$?

180
−35
−45



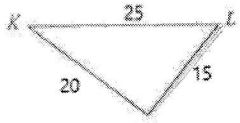
15) The line on the left was dilated by a scale factor of ½. Approximate the point of dilation.

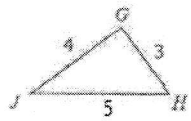


PoD ≈ (6, −1)

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

$\Delta LMK \sim \Delta$ HGJ

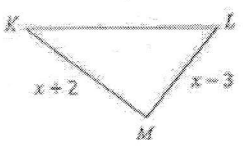


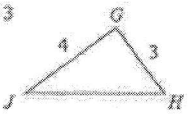


$\frac{15}{3} = \frac{20}{4} = \frac{25}{5}$

5

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





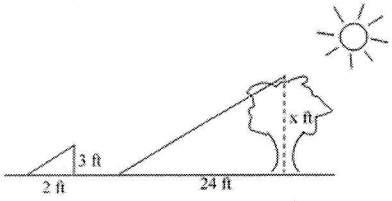
$\frac{x-3}{3} = \frac{x+2}{4}$

$4x - 12 = 3x + 6$

$-3x \qquad +12$

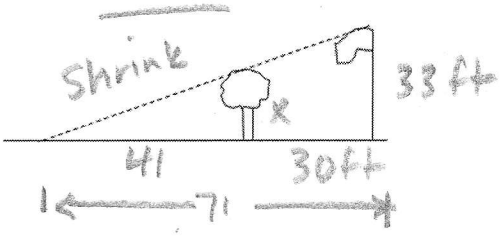
$x = 18$

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.



$\frac{24}{2} \times 3 = 36$ ft

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?



$\frac{5}{D} \quad \frac{x}{33} = \frac{41}{71}$

$71x = 1353$

71

$x = 19.06$