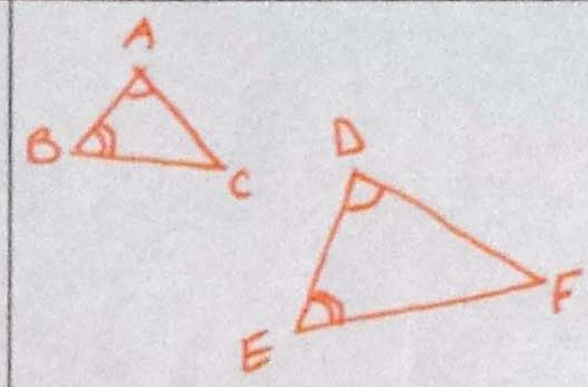
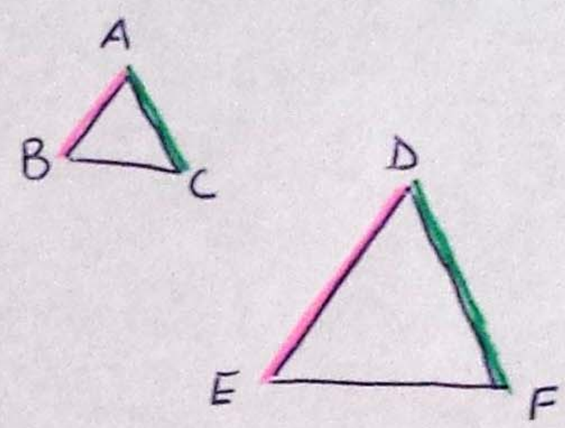
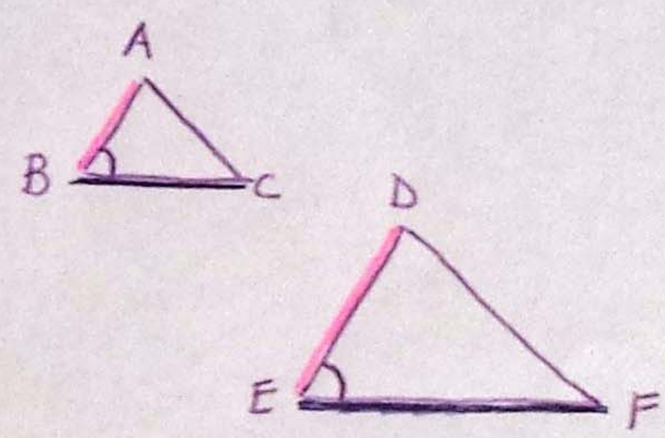
Geometry- Lesson 7-3 Notes

Name	Description	Hypothesis	Conclusion
Angle Angle Similarity Postulate (AA~)	If 2 angles of one triangle are ≅ to 2 angles of another triangle, then the triangles are ~		△ABC ~ △DEF
Side Side Side Similarity Theorem (SSS~)	If 3 sides of one triangle are PROPORTIONAL to the three CORRESPONDING sides of another triangle, then the triangles are ~		△ABC ~ △DEF
Side Angle Side Similarity Theorem (SAS~)	If 2 sides of one triangle are PROPORTIONAL to 2 sides of another triangle and their INCLUDED ∠s are congruent, then the triangles are ~		△ABC ~ △DEF

Properties of Similarity:

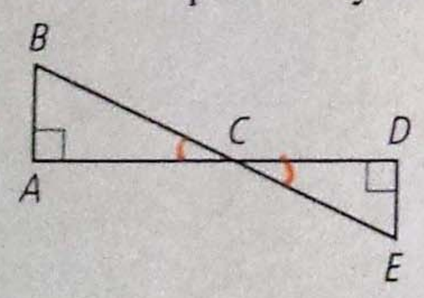
Reflexive Property of Similarity: (Reflex. Prop of ~) △ABC ~ △ABC

Symmetric Property of Similarity: (Sym. Prop of ~) if △ABC ~ △DEF then △DEF ~ △ABC

Transitive Property of Similarity: (Trans. Prop of ~) if △ABC ~ △DEF and △DEF ~ △XYZ then △ABC ~ △XYZ

Examples:

1. Explain why the triangles are similar and write a similarity statement.



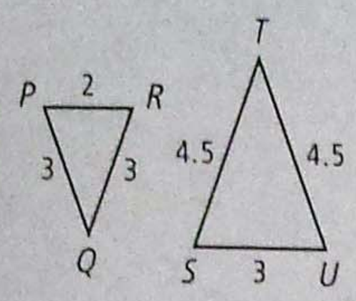
∠A ≅ ∠D — RT. ∠ THM

∠BCA ≅ ∠ECD — VERT. ∠ THM.

△ABC ~ △DEC — AA ~

2. Verify that the triangles are similar.

a. ΔPQR and ΔSTU



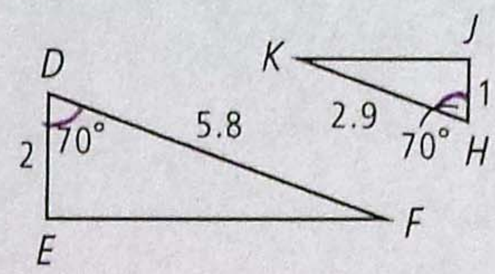
$\frac{PQ}{ST} = \frac{3}{4.5} = \frac{2}{3}$

$\frac{QR}{TU} = \frac{3}{4.5} = \frac{2}{3}$

$\frac{PR}{SU} = \frac{2}{3}$

ΔPQR ~ ΔSTU BY SSS ~

b. ΔDEF and Δ HJK



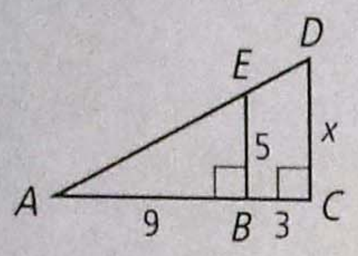
∠D ≅ ∠H DEF. ≅ ∠s

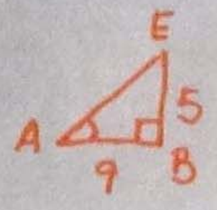
$\frac{DE}{HJ} = \frac{2}{1} = 2$

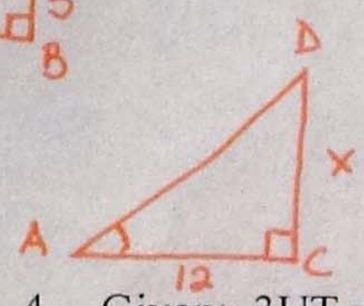
$\frac{DF}{HK} = \frac{5.8}{2.9} = 2$

ΔDEF ~ ΔHJK BY SAS ~

3. Explain why ΔABE ~ ΔACD, and then find CD.







∠A ≅ ∠A REFL. PROP. ≅

∠B ≅ ∠C RT. ∠ THM.

ΔABE ~ ΔACD AA ~

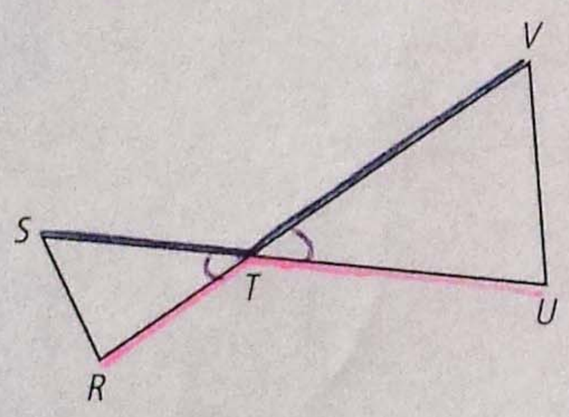
NOW FIND CD:

$\frac{9}{12} = \frac{5}{x}$

$9x = 60$

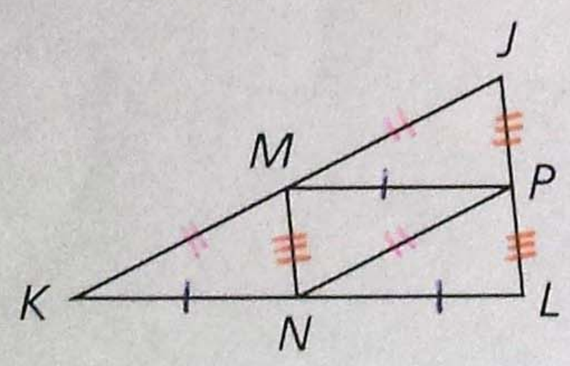
$x \approx 6.67$ OR $x = \frac{20}{3}$

4. Given: 3UT = 5RT and 3VT = 5ST
Prove: UVT ~ RST



STATEMENTS	REASONS
1. 3UT = 5RT 3VT = 5ST	1. GIVEN
2. $\frac{UT}{RT} = \frac{5}{3}$ ✓ $\frac{VT}{ST} = \frac{5}{3}$ ✓	2. DIVIDE BOTH SIDES BY 3RT DIVIDE BOTH SIDES BY 3ST
3. ∠RTS ≅ ∠VTU	3. VERT. ∠ THM.
4. ΔUVT ~ ΔRST	4. SAS ~ (2, 3)

5. Given: M is the midpoint of $\overline{JK}$
N is the midpoint of $\overline{KL}$
P is the midpoint of $\overline{JL}$
Prove: ΔJKL ~ ΔNPM



STATEMENTS	REASONS
1. M IS MDPT of $\overline{JK}$ N IS MDPT of $\overline{KL}$ P IS MDPT of $\overline{JL}$	1. GIVEN
2. $MP = \frac{1}{2}KL$ $MN = \frac{1}{2}JL$ $NP = \frac{1}{2}KJ$	2. Δ MIDSEG. THM.
3. $\frac{MP}{KL} = \frac{MN}{JL} = \frac{NP}{KJ} = \frac{1}{2}$	3. DIV. PROP. of =
4. ΔJKL ~ Δ NPM	4. SSS ~ (3)