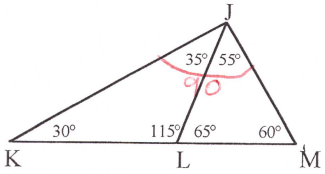
Geometry CP
Chapter 4 Practice Test, Fall 2013

Name Answer Key Date _____ Period _____

Show your work for full credit where needed, and write your answer in the space provided.

1. Classify all three triangles by their angles.



ΔJLM is a acute triangle.

ΔJKL is a obtuse triangle.

ΔJKM is a right triangle.

2. Find the measures of the sides of ΔMNO and classify the triangle by its **sides** if $M(2, 0)$, $N(5, 2)$, $O(3, 4)$.

$MN = \sqrt{(5-2)^2+(2-0)^2}$
$\sqrt{3^2+2^2}$
$\sqrt{9+4}$
$MN = \sqrt{13}$

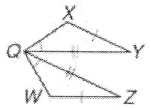
$NO = \sqrt{(5-3)^2+(2-4)^2}$
$\sqrt{2^2+(-2)^2}$
$\sqrt{4+4}$
$NO = \sqrt{8}$

$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$MO = \sqrt{(2-3)^2+(0-4)^2}$
$\sqrt{(-1)^2+(-4)^2}$
$\sqrt{1+16}$
$MO = \sqrt{17}$

ΔMNO is a scalene Δ.

3. What are the congruent triangles in the diagram?



$\Delta QXY \cong \Delta QWZ$

4. Given: $\Delta ABC \cong \Delta DEF$. Complete the statements:

a) $\overline{AC} \cong$ DF b) $\angle FDE \cong$ $\angle CAB$

5. Given ΔCAT where $m\angle C = (5x - 30)°$, $m\angle A = 3x°$, and $m\angle T = (2x + 45)°$. Find:

x= 16.5 m∠C= 52.5 m∠A= 49.5 m∠T= 78

$m\angle C + m\angle A + m\angle T = 180$
$5x-30+3x+2x+45 = 180$
$10x+15 = 180$
$-15 \quad -15$
$\frac{10x}{10} = \frac{165}{10}$
$x = 16.5$

$m\angle C = 5(16.5) - 30$
$82.5 - 30$
52.5

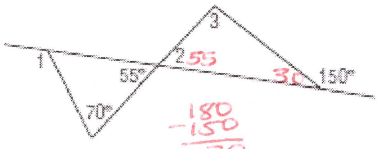
$m\angle A = 3(16.5)$
49.5

$m\angle T = 2(16.5) + 45$
78

6. What is m∠1 and m∠3?

m∠1: 125

This should say m∠3 → m∠3: 95

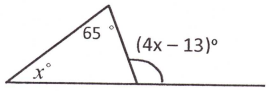


$m\angle 1 = 55 + 70$
125

$180 - 150$
30

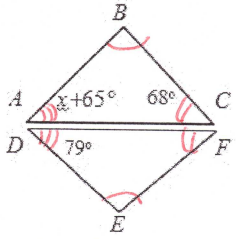
$m\angle 3 = 180 - (55+30)$
$180 - 85$
95

7. Solve for x in the figure below. 26



$x + 65 = 4x - 13$
$-x \quad -x$
$65 = 3x - 13$
$+13 \quad +13$
$\frac{78}{3} = \frac{3x}{3}$
$x = 26$

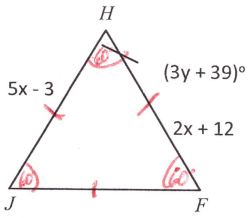
8. In the diagram, $\angle B \cong \angle E$ and $\angle C \cong \angle F$. Find the value of x. 14



$x + 65 = 79$
$-65 \quad -65$
$x = 14$

9. Triangle FJH is an equilateral triangle. Find:

$x =$ 5 $y =$ 7

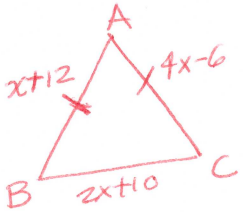


$5x - 3 = 2x + 12$
$-2x \quad -2x$
$3x - 3 = 12$
$+3 \quad +3$
$\frac{3x}{3} = \frac{15}{3}$
$x = 5$

$3y + 39 = 60$
$-39 \quad -39$
$\frac{3y}{3} = \frac{21}{3}$
$y = 7$

10. ΔABC is isosceles, $\angle A$ is the vertex angle, AB=x + 12, AC= 4x – 6, and BC= 2x + 10. Find:

x 6 AB 18 AC 18 BC 22



$x + 12 = 4x - 6$
$-x \quad -x$
$12 = 3x - 6$
$+6 \quad +6$
$\frac{18}{3} = \frac{3x}{3}$
$x = 6$

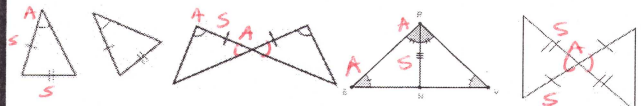
$AB = x + 12$
$6 + 12$
18

$AC = 4(6) - 6$
$24 - 6$
18

$BC = 2(6) + 10$
$12 + 10$
22

11. Give a reason why these triangles are congruent. Use the choices below.

A) AAS ≅ B) SSS≅ C) AAA ≅ D) SAS ≅
E) ASA ≅ F) SSA ≅ G) Not possible

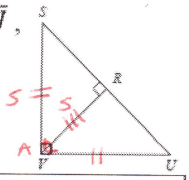


a) G b) E c) A d) D

12. Complete the proof below by using the list of reasons that follow. Write the letter that corresponds to the reason in the box provided.

Given: ΔSVU is isosceles with base $\overline{SU}$, $\overline{VR}$ bisects ∠SVU

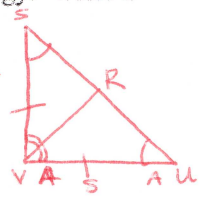
Prove: $\overline{SR} \cong \overline{RU}$



Statements	Reasons
1. ΔSVU is isosceles with base $\overline{SU}$, $\overline{VR}$ bisects ∠SVU	I
2. $\overline{SV} \cong \overline{VU}$	J
3. ∠SVR ≅ ∠UVR	F
4. $\overline{VR} \cong \overline{VR}$	D
5. ΔSVR ≅ ΔUVR	E
6. $\overline{SR} \cong \overline{RU}$	A

~~A~~. CPCTC
B. Symmetric Property
C. ASA ≅
~~D~~. Reflexive Property
~~E~~. SAS ≅
~~F~~. Angle Bisector Theorem
G. AAA ≅
H. Isosceles Triangle Theorem
~~I~~. Given
~~J~~. Definition of Isosceles Δ
K. Converse of the Isosceles Triangle Theorem

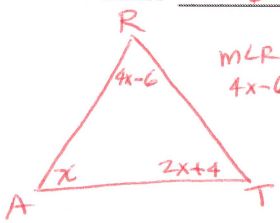
13) EXTRA CREDIT: The proof above could be done using a slightly different strategy. Write a different proof here.



Statements	Reasons
1) ΔSVU is isosceles with base $\overline{SU}$; $\overline{VR}$ bisects ∠SVU	1) Given
2) ∠U ≅ ∠S	2) converse of the Isosceles Δ thm
3) ∠SVR ≅ ∠UVR	3) Angle Bisector Thm
4) ΔSVR ≅ ΔUVR	4) ASA ≅
5) $\overline{SR} \cong \overline{RU}$	5) CPCTC

14) Extra credit: In ΔRAT, m∠T is 4 more than twice m∠R, and m∠A is 6 less than four times m∠R. What is the measure of each angle? You must show your work for full credit.

m∠R= 26 m∠A= 98 m∠T= 56



m∠R + m∠A + m∠T = 180
4x-6 + x + 2x+4 = 180
7x = 180
7x = 182
x = 26

m∠A = 4(26) - 6
104 - 6
98

m∠T = 2(26) + 4
52 + 4
56

m∠R = 26

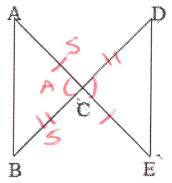
15. **Given:** K is the midpoint of $\overline{JM}$; $\overline{JN} \parallel \overline{LM}$.

Prove: ΔJKN ≅ ΔMKL

Statements	Reasons
1. K is the midpoint of $\overline{JM}$;.	1. Given
2. $\overline{JK} \cong \overline{KM}$	2. Def. of midpoint
3. $\overline{JN} \parallel \overline{LM}$	3. Given
4. ∠KJN ≅ ∠KML	4. Alt. int. ∠s thm
5. ∠JKN ≅ ∠LKM	5. Vertical ∠s thm
6. ΔJKN ≅ ΔMKL	6. ASA ≅

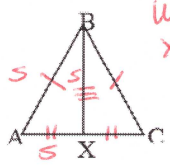
16. **Given:** C is the midpoint of $\overline{AE}$ and $\overline{BD}$

Prove: ΔACB ≅ ΔDCE

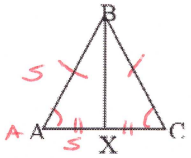


Statements	Reasons
1) C is the midpt of $\overline{AE}$ and $\overline{BD}$	1) Given
2) $\overline{AC} \cong \overline{CE}$; $\overline{BC} \cong \overline{CD}$	2) Midpt thm
3) ∠ACB ≅ ∠ECD	3) Vertical ∠s thm
4) ΔACB ≅ ΔDCE	4) SAS ≅

17. **Given:** $\overline{AB} \cong \overline{BC}$, X is the midpoint of $\overline{AC}$, it can be proved that ΔABX ≅ ΔCBX in two slightly different ways. Without doing the proofs, discuss, in full detail in the blank area, the two different strategies that could be used. You have been given the diagram twice so that you can mark one separately for each strategy.



We know that $\overline{AB} \cong \overline{BC}$. Since X is the midpoint of $\overline{AC}$, $\overline{AC} \cong \overline{XC}$. $\overline{BX}$ is congruent to itself. Therefore, since all three sides are ≅, ΔABX ≅ ΔCBX by SSS ≅.



We can also look at ΔABC, and notice that it is an isosceles Δ. That means, therefore, that ∠A and ∠C are the base angles, which means they are ≅. $\overline{AX} \cong \overline{XC}$, and $\overline{AB} \cong \overline{BC}$; therefore, ΔABX ≅ ΔCBX because of SAS ≅.