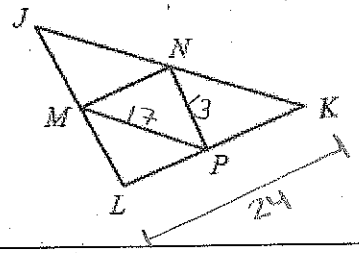
Unit 7 Quiz Study Guide
(Relationships in Triangles)

Name: Key

Date: _____ Block: _____

Topic 1: Midsegments

In the diagram below, $\overline{MN}$, $\overline{NP}$, and $\overline{PM}$ are midsegments.



1. Name all parallel segments:

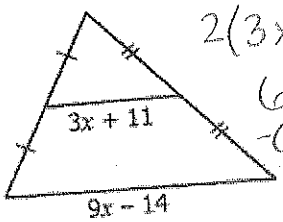
$\overline{MN} \parallel \overline{LK}$, $\overline{NP} \parallel \overline{JL}$, $\overline{MP} \parallel \overline{JK}$

2. If $MP = 17$, $LK = 24$ and $PN = 13$, find each measure.

a) $JK =$ 34 **c)** $JL =$ 26 24+26+34

b) $MN =$ 12 **d)** Perimeter of ΔJKL: 84

3. Solve for x.



$2(3x+11) = 9x-14$

$6x+22 = 9x-14$

$-6x \quad -6x$

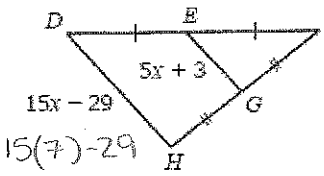
$22 = 3x-14$

$+14 \quad +14$

$\frac{36}{3} = \frac{3x}{3}$

$12 = x$

4. Find DH.



$2(5x+3) = 15x-29$

$10x+6 = 15x-29$

$-10x \quad -10x$

$6 = 5x-29$

$+29 \quad +29$

$\frac{35}{5} = \frac{5x}{5}$

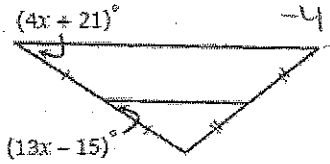
$7 = x$

$15(7)-29$

$105-29$

76

5. Solve for x.



$4x+21 = 13x-15$

$-4x \quad -4x$

$21 = 9x-15$

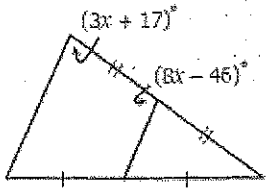
$+15 \quad +15$

$\frac{36}{9} = \frac{9x}{9}$

$4 = x$

Corresponding angles

6. Solve for x.



$3x+17+8x-46 = 180$

$11x-29 = 180$

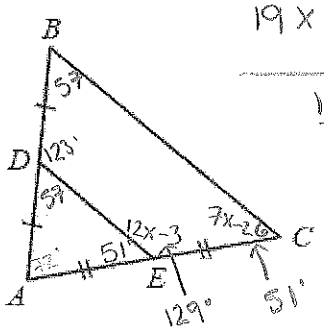
$+29 \quad +29$

$\frac{11x}{11} = \frac{209}{11}$

$x = 19$

Consecutive interior angles

7. If $m\angle DEC = (12x-3)^\circ$, $m\angle BCE = (7x-26)^\circ$, and $m\angle DAE = 72^\circ$, find each angle measure.



$12x-3+7x-26 = 180$

$19x-29 = 180$

$+29 \quad +29$

$\frac{19x}{19} = \frac{209}{19}$

$x = 11$

$m\angle DEC =$ 129°

$m\angle BCE =$ 51°

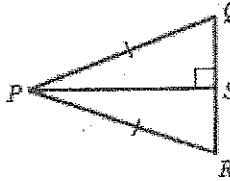
$m\angle ADE =$ 57°

$m\angle EDB =$ 123°

$m\angle DBC =$ 57°

Topic 2: Perpendicular Bisectors & Angle Bisectors

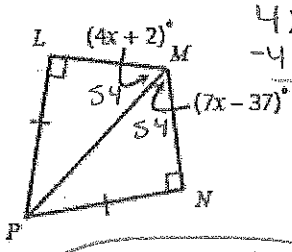
8. Find SR.



$10x - 3 = 3x + 39$
$-3x \quad -3x$
$7x - 3 = 39$
$+3 \quad +3$
$\frac{7x}{7} = \frac{42}{7}$
$x = 6$

$3(6) + 39$
57

9. Find $m\angle LMN$.



$4x + 2 = 7x - 37$
$-4x \quad -4x$
$2 = 3x - 37$
$+37 \quad +37$
$\frac{39}{3} = \frac{3x}{3}$
$13 = x$

$m\angle LMN = 108°$

Topic 4: Inequalities in Triangles

Directions: Determine whether the side lengths could form a triangle. Prove your answer with an inequality.

10. 5 ft, 2 ft, 10 ft
$5 + 2 > 10$
$7 \not> 10$
NO!

11. 37 in, 18 in, 25 in
$18 + 25 > 37$
$43 > 37$
Yes!

12. 15 m, 50 m, 37 m
$15 + 37 > 50$
$52 > 50$
Yes!

13. 7 cm, 24 cm, 31 cm
$7 + 24 > 31$
$31 \not> 31$
NO!

Directions: Given the measures of two sides of a triangle, find the range of values for the third side.

14. 3 km, 48 km
$48 - 3 < x < 48 + 3$
$45 < x < 51$

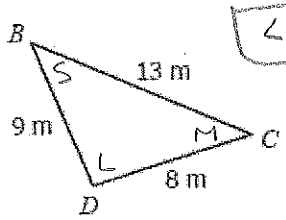
15. 11 ft, 24 ft
$24 - 11 < x < 24 + 11$
$13 < x < 35$

16. If two sides of a triangle measure 19 cm and 34 cm, check all possible values for the third side.

☐ 13 ☐ 15 ☑ 21 ☑ 38 ☑ 52 ☐ 59

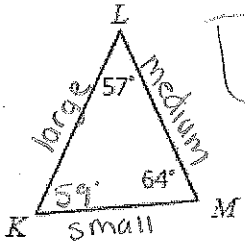
$34 - 19 < x < 34 + 19$
$15 < x < 53$

17. Give the angles in order from least to greatest.



$\angle B, \angle C, \angle D$

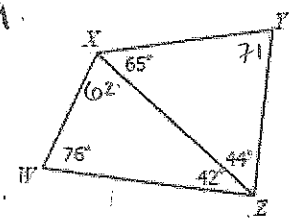
18. Give the sides in order from least to greatest.



$\overline{KM}, \overline{LM}, \overline{KL}$

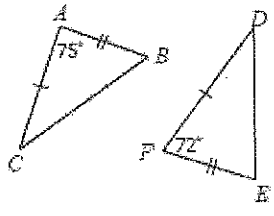
Directions: Compare the sides by filling in the blank with a < or > symbol.

19.



$WZ \_\_<\_\_ XZ$
$XY \_\_<\_\_ YZ$
$XZ \_\_>\_\_ YZ$

20.

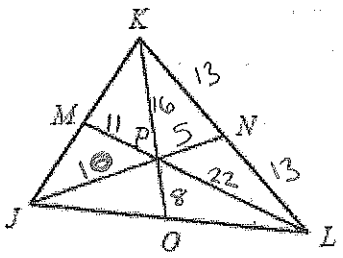


$BC \_\_>\_\_ DF$

Topic 3: Medians & Centroids

21.

If P is the **centroid** of ΔJKL, $PN = 5$, $LM = 33$, $KP = 16$, and $NL = 13$, find each measure.



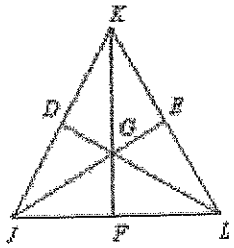
$PM =$ 11 $JP =$ 10

$PL =$ 22 $JN =$ 15

$PO =$ 8 $KL =$ 26

22.

In ΔJKL, $\overline{JE}$, $\overline{KF}$, and $\overline{LD}$ are medians.

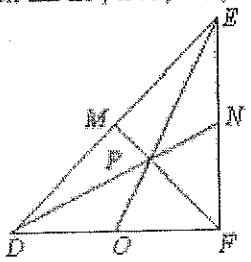


1. If $GF = 15$, then $KG =$ 30
2. If $JG = 13$, then $\overline{JE} =$ 19.5
3. If $JL = 22$, then FL = 11
4. If $KE = 20$, then KL = 40
5. If $DL = 24$, $\overline{LG} =$ 16

   and $\overline{DG} =$ 8

23.

In ΔDEF, $\overline{DN}$, $\overline{EO}$, and $\overline{FM}$ are medians.

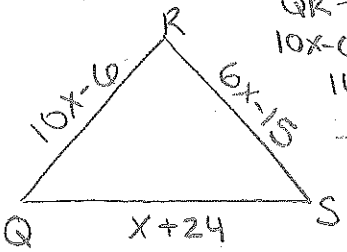


6. If $DE = 45$, then DM = 22.5
7. If $PD = 20$, then $\overline{PN} =$ 10
8. If $DO = 8.5$, then FD = 17
9. If $OE = 22$, $\overline{EP} =$ 14.6 or 14.7

   and $\overline{OP} =$ 7.3
10. If $MP = 10$, then $PF =$ 20

Topic 5: Triangle Inequalities & Algebra

24 If the sides of a ΔQRS are $QR = 10x - 6$, $RS = 6x - 15$, $QS = x + 24$, find a range of possible values for x.



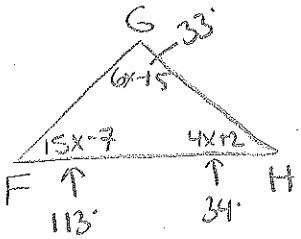
$QR + RS > QS$
$10x-6+6x-15 > x+24$
$16x-21 > x+24$
$-x \quad -x$
$15x-21 > 24$
$+21 \quad +21$
$\frac{15x}{15} > \frac{45}{15}$
$x > 3$

$QR + QS > RS$
$10x-6 + x+24 > 6x-15$
$11x+18 > 6x-15$
$-6x \quad -6x$
$5x+18 > -15$
$-18 \quad -18$
$\frac{5x}{5} > \frac{-33}{5}$
$x > -6.6$

$QS + RS > QR$
$x+24+6x-15 > 10x-6$
$7x+9 > 10x-6$
$-7x \quad -7x$
$9 > 3x-6$
$+6 \quad +6$
$\frac{15}{3} > \frac{3x}{3}$
$5 > x$

Range of Values: $3 < x < 5$

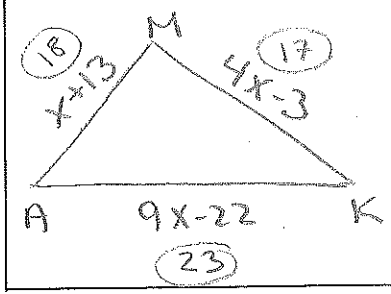
25. List the sides of ΔFGH in order from least to greatest if $m\angle F = (15x - 7)^\circ$, $m\angle G = (6x - 15)^\circ$, and $m\angle H = (4x + 2)^\circ$.



$15x-7+6x-15+4x+2 = 180$
$25x-20 = 180$
$+20 \quad +20$
$\frac{25x}{25} = \frac{200}{25}$
$x = 8$

$\overline{FH}, \overline{FG}, \overline{GH}$

26 List the angles of ΔAMK in order from least to greatest if $AM = x + 13$, $MK = 4x - 3$, $AK = 9x - 22$, and the perimeter of $\Delta AMK = 58$.



$x+13+4x-3+9x-22 = 58$
$14x-12 = 58$
$+12 \quad +12$
$\frac{14x}{14} = \frac{70}{14}$
$x = 5$

$\angle A, \angle K, \angle M$