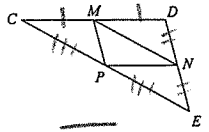
Kuta Software - Infinite Geometry Name_____

Midsegment of a Triangle

Date_____ Period____

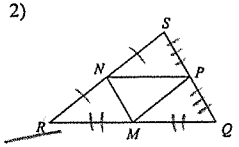
In each triangle, M, N, and P are the midpoints of the sides. Name a segment parallel to the one given.

1)



$\overline{CD} \parallel \overline{PN}$

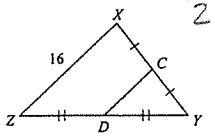
2)



$\overline{NM} \parallel \overline{QS}$

Find the missing length indicated.

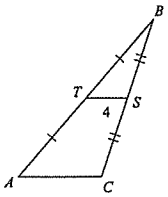
3) Find *CD*



$\frac{16}{2} = 8$

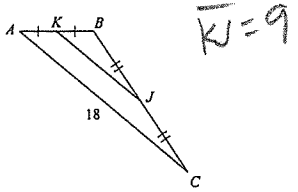
$\overline{CD} = 8$

4) Find *AC*



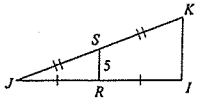
$\overline{AC} = 8$

5) Find *KJ*



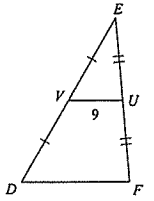
$\overline{KJ} = 9$

6) Find *IK*



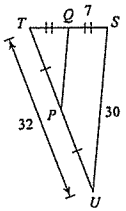
$\overline{KI} = 10$

7) Find *DF*



$\overline{DF} = 18$

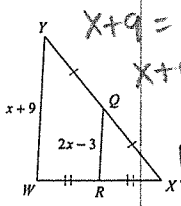
8) Find *PQ*



$\overline{PQ} = 15$

Solve for *x*. $\overline{YW} = 2(\overline{QR})$

9)



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

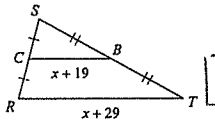
$x+9 = 4x-6$

$9 = 3x-6$

$\frac{15}{3} = \frac{3x}{3}$

$5 = x$

10)



$\overline{RT} = 2(\overline{CB})$

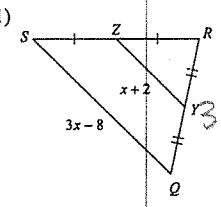
$x+29 = 2(x+19)$

$x+29 = 2x+38$

$29 = x+38$

$-9 = x$

11)



$\overline{SD} = 2(\overline{ZY})$

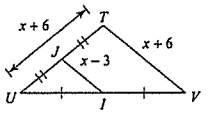
$3x-8 = 2(x+2)$

$3x-8 = 2x+4$

$x-8 = 4$

$x = 12$

12)



$\overline{TV} = 2(\overline{JI})$

$x+6 = 2(x-3)$

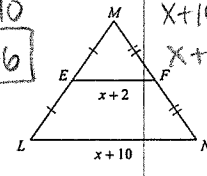
$x+6 = 2x-6$

$6 = x-6$

$12 = x$

Find the missing length indicated.

13) Find *LN*



$\overline{LN} = 2(\overline{EF})$

$\overline{LN} = 6+10$

$\overline{LN} = 16$

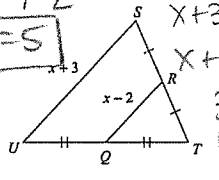
$x+10 = 2(x+2)$

$x+10 = 2x+4$

$10 = x+4$

$6 = x$

14) Find *RQ*



$\overline{SU} = 2(\overline{RQ})$

$\overline{RQ} = 7-2$

$\overline{RQ} = 5$

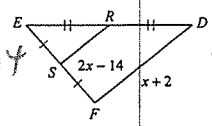
$x+3 = 2(x-2)$

$x+3 = 2x-4$

$3 = x-4$

$7 = x$

15) Find *SR*



$\overline{FD} = 2(\overline{SR})$

$\overline{SR} = 2(10)-14$

$\overline{SR} = 6$

$x+2 = 2(2x-14)$

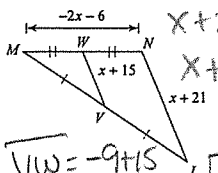
$x+2 = 4x-28$

$2 = 3x-28$

$30 = 3x$

$10 = x$

16) Find *VW*



$\overline{NL} = 2(\overline{WV})$

$\overline{VW} = -9+15$

$\overline{VW} = 6$

$x+21 = 2(x+15)$

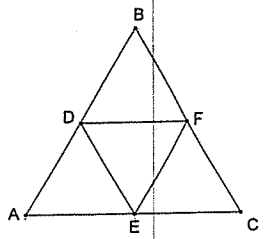
$x+21 = 2x+30$

$21 = x+30$

$-9 = x$

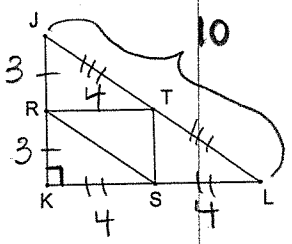
Midsegment Theorem Worksheet Name: _____

Use the diagram of ΔABC where D, E, and F are the midpoints of the sides.



1. $\overline{DE} \parallel$ $\overline{BC}$
2. $\overline{FE} \parallel$ $\overline{BA}$
3. If AB = 14, then EF = 7
4. If AE = 8, then DF = 8
5. If DE = 6, then BC = 12

Use the diagram of ΔJKL where R, S, and T are midpoints of the sides, RK = 3, KS = 4, and $\overline{JK} \perp \overline{KL}$ JL = 10

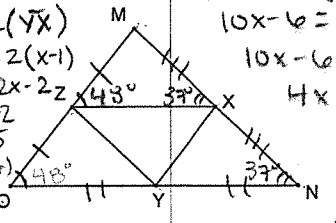


6. Find the length of RS. $\overline{RS} = 5$
7. Find the length of JK. $\overline{JK} = 6$
8. Find the length of RT $\overline{RT} = 4$
9. Find the perimeter of ΔJKL. 24

Use the diagram of ΔMNO where X, Y, and Z are midpoints of the sides.

10. If YZ = 3x + 1, and MN = 10x – 6 then YZ = 7
11. If YX = x – 1, and MO = 3x – 7, then MO = 8
12. If $m\angle MON = 48°$, then $m\angle MZX$ = 48°
13. If $m\angle MXZ = 37°$, then $m\angle MNO$ = 37°

$\overline{MO} = 2(\overline{YX})$
$3x-7 = 2(x-1)$
$3x-7 = 2x-2$
$x-7 = -2$
$x = 5$
$MO = 3(5)-7$
$\overline{MO} = 8$

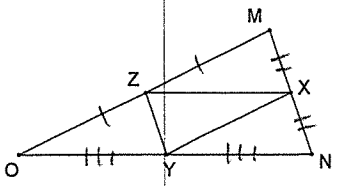


$\overline{MN} = 2(\overline{ZY})$
$10x-6 = 2(3x+1)$
$10x-6 = 6x+2$
$4x-6 = 2$
$4x = 8$
$x = 2$
$ZY = 3(2)+1$
$\overline{ZY} = 7$

Use the diagram of ΔMNO where, X, Y, and Z are the midpoints.

14. If YZ = 2x + 3, and MN = 5x – 14, then YZ = 43
15. If YX = 3x – 4, and MO = 9x – 20, then MO = 16

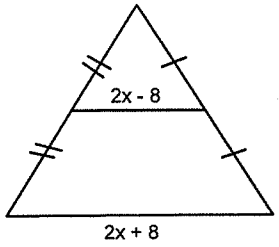
$\overline{MN} = 2(YZ)$ $x = 20$ $YZ = 2(20)+3$
$\overline{YZ} = 43$
$5x-14 = 2(2x+3)$
$5x-14 = 4x+6$
$x-14 = 6$



$\overline{MO} = 2(\overline{YX})$
$9x-20 = 2(3x-4)$
$9x-20 = 6x-8$
$3x-20 = -8$
$3x = 12$
$x = 4$

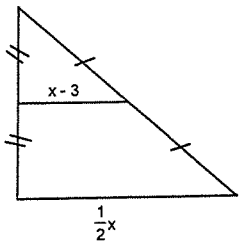
$\overline{MO} = 9(4)-20$
$\overline{MO} = 16$

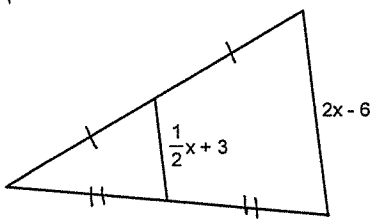
Assume the middle line is a midsegment in the problems below:



$2x+8 = 2(2x-8)$
$2x+8 = 4x-16$
$8 = 2x-16$
$24 = 2x$
$12 = x$

$\frac{1}{2}x = 2(x-3)$
$\frac{1}{2}x = 2x-6$
$-1.5x = -6$
$x = 4$





$2x-6 = 2(\frac{1}{2}x+3)$
$2x-6 = x+6$
$x-6 = 6$
$x = 12$