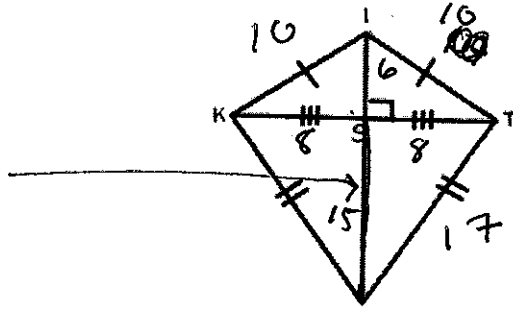


A **KITE** is a quadrilateral that has two pairs of congruent consecutive sides, but opposite sides are not congruent. The diagonals are perpendicular and only one of them is bisected. So four sets of **right triangles** are formed.

$$\begin{array}{r} a^2 + 8^2 = 17^2 \\ a^2 + 64 = 289 \\ -64 \quad -64 \\ \hline a^2 = 225 \end{array}$$



$$\begin{array}{l} 6^2 + 8^2 = c^2 \\ 36 + 64 = c^2 \\ 10 = c \end{array}$$

Since there are right triangles, we can use the **PYTHAGOREAN THEOREM!**

$$(a^2 + b^2 = c^2)$$

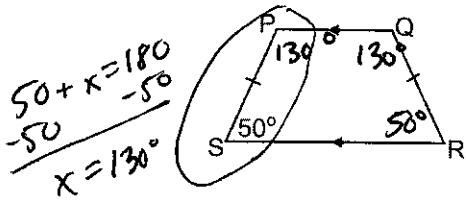
If SI = 6, ST = 8 and ET = 17, then

IT = 10 SE = 15 KT = 16 KI = 10 and IE = 21.

Using the markings on the diagram of KITE, $\triangle SIT \cong \triangle SIK$ by HL.

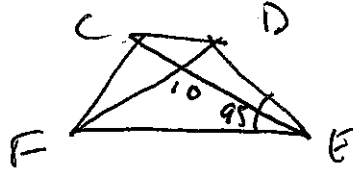
Classwork

1. Find the $m\angle P$, $m\angle Q$, and $m\angle R$.



$$\begin{array}{r} 50 + x = 180 \\ -50 \\ \hline x = 130^\circ \end{array}$$

2. CDEF is an isosceles trapezoid with CE = 10 and $m\angle E = 95^\circ$. Find DF, $m\angle C$, $m\angle D$, and $m\angle F$. (Draw a picture)

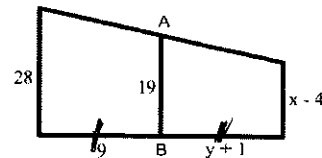


$$\begin{array}{l} \overline{DF} = 10 \\ m\angle C = 95^\circ \\ m\angle D = 95^\circ \\ m\angle F = 95^\circ \end{array}$$

3. \overline{AB} is a midsegment of the trapezoid. $x = 14$; $y = 8$

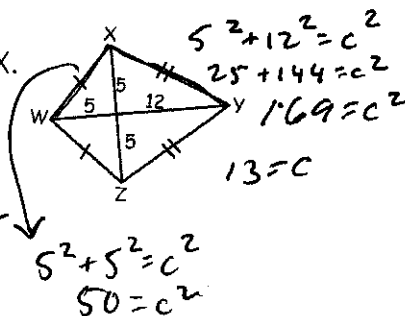
$$\frac{28 + x - 4}{2} = 19$$

$$\begin{array}{r} 24 + x = 38 \\ -24 \quad -24 \\ \hline x = 14 \end{array}$$



$$\begin{array}{l} 9 = y + 1 \\ y = 8 \end{array}$$

4. Find XY and WX.



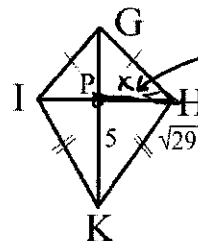
$$\begin{array}{l} 5^2 + 12^2 = c^2 \\ 25 + 144 = c^2 \\ 169 = c^2 \\ 13 = c \end{array}$$

$$XY = 13$$

$$WX = \sqrt{50} = 5\sqrt{2}$$

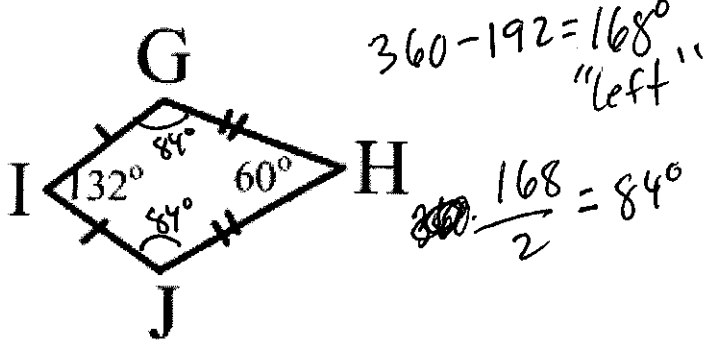
$$\begin{array}{l} 5^2 + 5^2 = c^2 \\ 50 = c^2 \end{array}$$

5. Find HP.

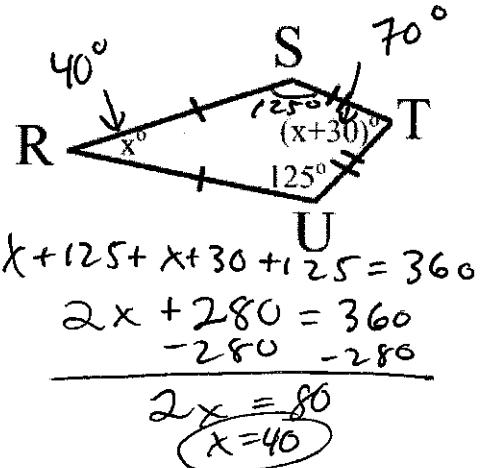


$$\begin{array}{l} 1^2 + 5^2 = \sqrt{29}^2 \\ x^2 + 25 = 29 \\ x^2 = 4 \\ x = 2 \end{array}$$

6. Find $m\angle G$ and $m\angle J$.



7. Find $m\angle R$, $m\angle S$, & $m\angle T$.



TRAP is an isosceles trapezoid with median **EZ**. Find the unknown measures.

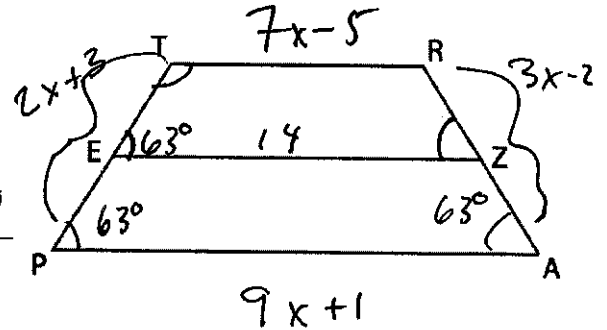
8. If $TP = 2x + 3$ and $RA = 3x - 2$, then $TP = \underline{13}$

$$\begin{array}{r} 2x + 3 = 3x - 2 \\ -2x + 2 \quad -2x + 2 \\ \hline x = 5 \end{array}$$

9. If $TR = 7x - 5$, $PA = 9x + 1$, and $EZ = 14$, then $x = \underline{2}$

$$\frac{7x - 5 + 9x + 1}{2} = 14 \rightarrow \frac{16x - 4}{2} = 14 \rightarrow 28 = 16x - 4$$

10. If $m\angle TPA = 63^\circ$, then $m\angle RAP = \underline{63^\circ}$, $m\angle TEZ = \underline{63^\circ}$
 and $m\angle PTR = \underline{117^\circ}$
 $180 - 63 =$



11. If $m\angle RZE = 8x - 6$ and $m\angle RAP = 6x + 2$ then $x = \underline{4}$

$$8x - 6 = 6x + 2$$

$$2x = 8$$

LMNP is a kite. Find the unknown measures.

12. If $MN = 4x + 5$ and $NP = 6x - 1$, then $MN = \underline{17}$
 $4x + 5 = 6x - 1$

$6 = 2x$ $x = 3$

13. If $m\angle LMP = 58^\circ$ and $m\angle LPM = 7x + 2$, then $x = \underline{8}$
 $7x + 2 = 58$
 $7x = 56$

14. If $m\angle MQN = 8x - 14$, then $x = \underline{13}$

$$\begin{array}{r} 8x - 14 = 90 \\ +14 \quad +14 \\ \hline 8x = 104 \end{array}$$

