

Name: KEY

Date: _____

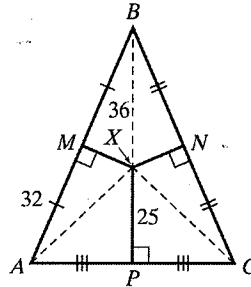
Practice 5.2 – Bisectors of a Triangle & Inscribed/Circumscribed Circles

1. The circumcenter of $\triangle ABC$ is point X .

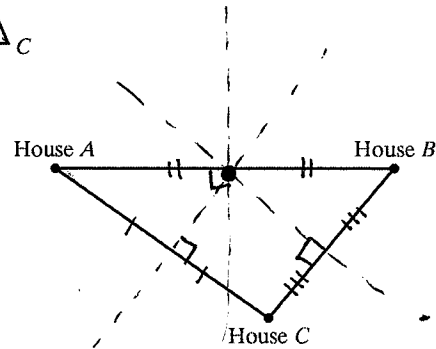
Fill in the blanks.

a) $AX = \underline{BX} = \underline{CX}$

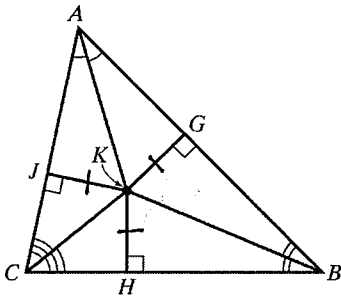
b) $AX = \underline{36}$ units



2. A mailbox for the neighborhood is to be located equidistant from three houses: A , B , and C . *Sketch* the location of the mailbox.



3. $KJ = 3x + 12$ and $KH = 6x - 15$. What is KG ?



$$3x + 12 = 6x - 15$$

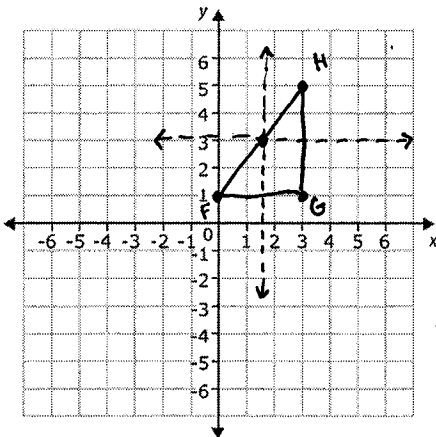
$$27 = 3x$$

$$9 = x$$

$$3(9) + 12 = 39$$

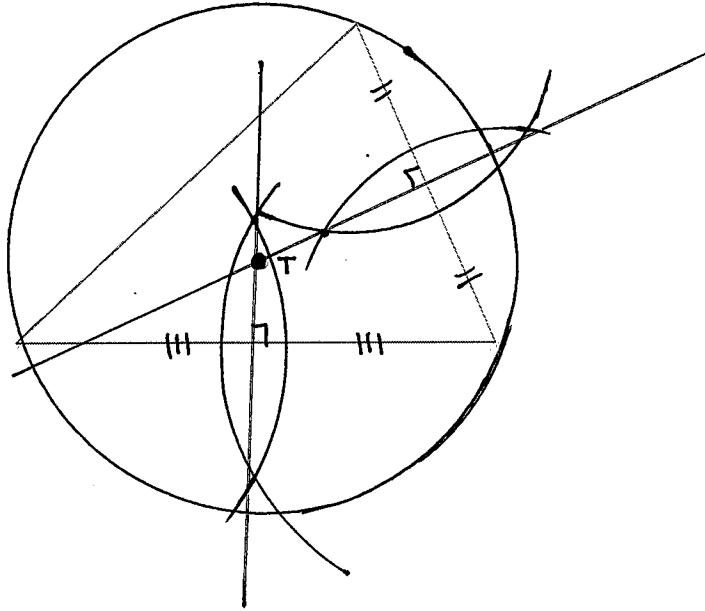
$$\underline{KG = 39 \text{ units}}$$

4. What are the coordinates of the circumcenter of the triangle with vertices $F(0, 1)$, $G(3, 1)$, and $H(3, 5)$?

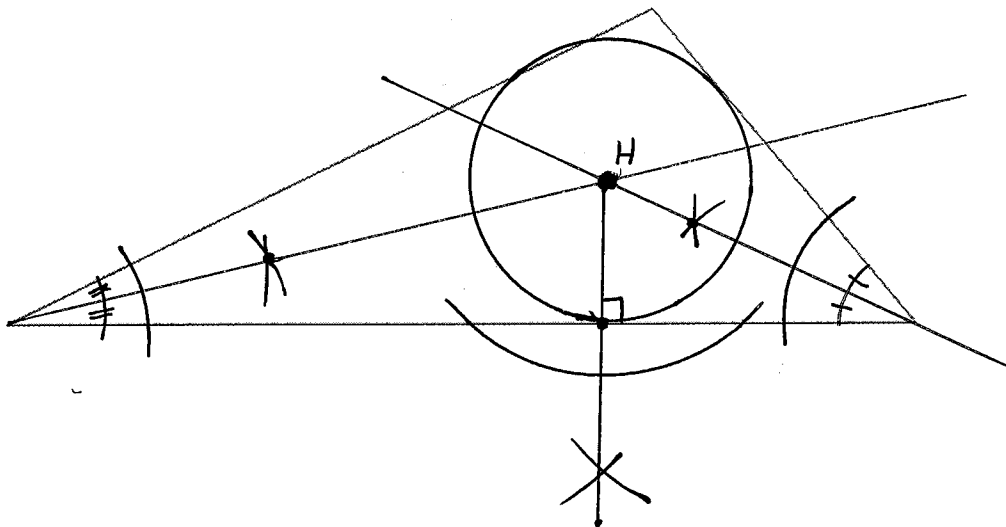


$$(1.5, 3)$$

5. **Construct** circle T , the circumscribed circle of the triangle below.



6. **Construct** circle H , the inscribed circle of the triangle below.



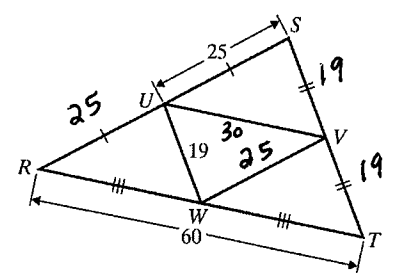
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Practice 5.3/5.4– Medians, Altitudes & Midsegments of a Triangle

1. In triangle ΔRST , what are the lengths of \overline{SV} , \overline{ST} , \overline{VW} , and \overline{UV} ?

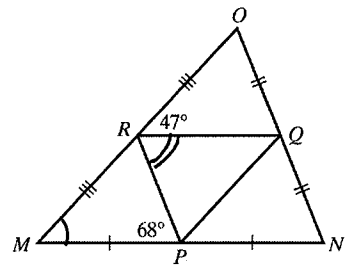
$SV = 19$
 $ST = 38$
 $VW = 25$
 $UV = 30$



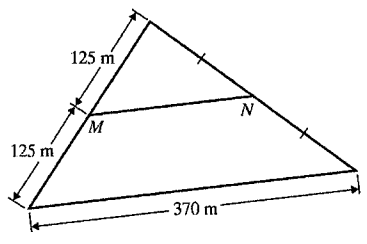
2. Observe the three pairs of midsegments and sides that are parallel in ΔMNO .

a. Find $m\angle NMO$. 47°

b. Find $m\angle PRQ$. 68°



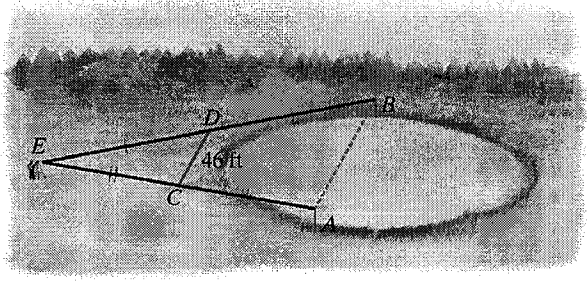
3. \overline{MN} represents a sidewalk planned for the park in the figure below. What is the length of the sidewalk?



$185m$

4. A geologist wants to determine the distance, AB , across a sinkhole. Choosing a point E outside the sinkhole, she directly measures the distances AE and BE . She locates the midpoints C and D of segments AE and BE and then measures segment CD and finds it has length of 46 feet. What is the distance across the sinkhole?

$92ft$



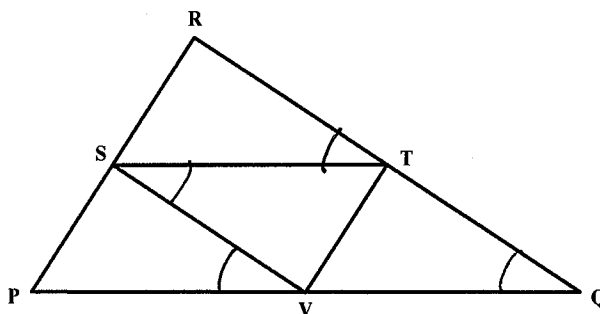
5. S , T , and V are midpoints of \overline{RP} , \overline{RQ} , and \overline{PQ} . Complete the following statements.

a. $SV = \frac{1}{2} \underline{RQ}$

b. If $TV = 3.75$, $RP = \underline{7.5}$

c. If $PQ = 7.4$, $ST = \underline{3.7}$

d. $m\angle RTS = m\angle \underline{TQV}$
 $= m\angle \underline{SVP} = m\angle \underline{VST}$



6. D and E are midpoints of the sides of $\triangle ABC$. Complete each statement.

a. If $DE = 18$, $BC = \underline{36}$

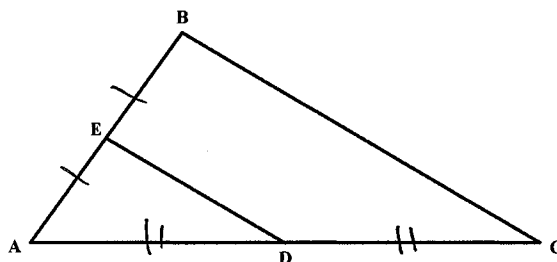
b. If $BC = 15$, $DE = \underline{7.5}$

c. If $DE = 3x$, $BC = 4x + 10$, $DE = \underline{15}$

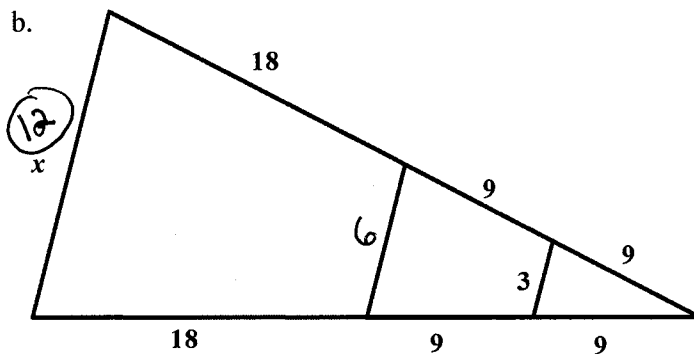
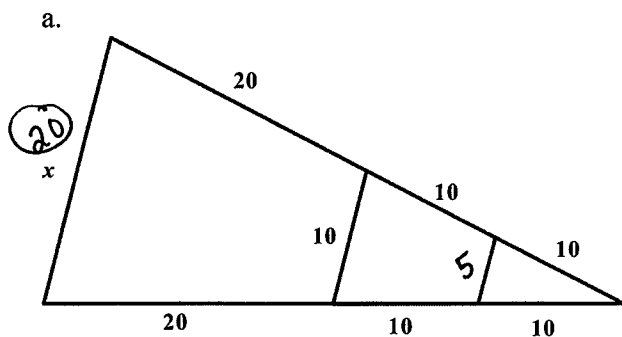
$$\begin{aligned} 2(3x) &= 4x + 10 \\ 6x &= 4x + 10 \\ 2x &= 10 & 2(5) \\ x &= 5 \end{aligned}$$

d. If $DE = x + 9$, $BC = 4x + 2$, $BC = \underline{34}$

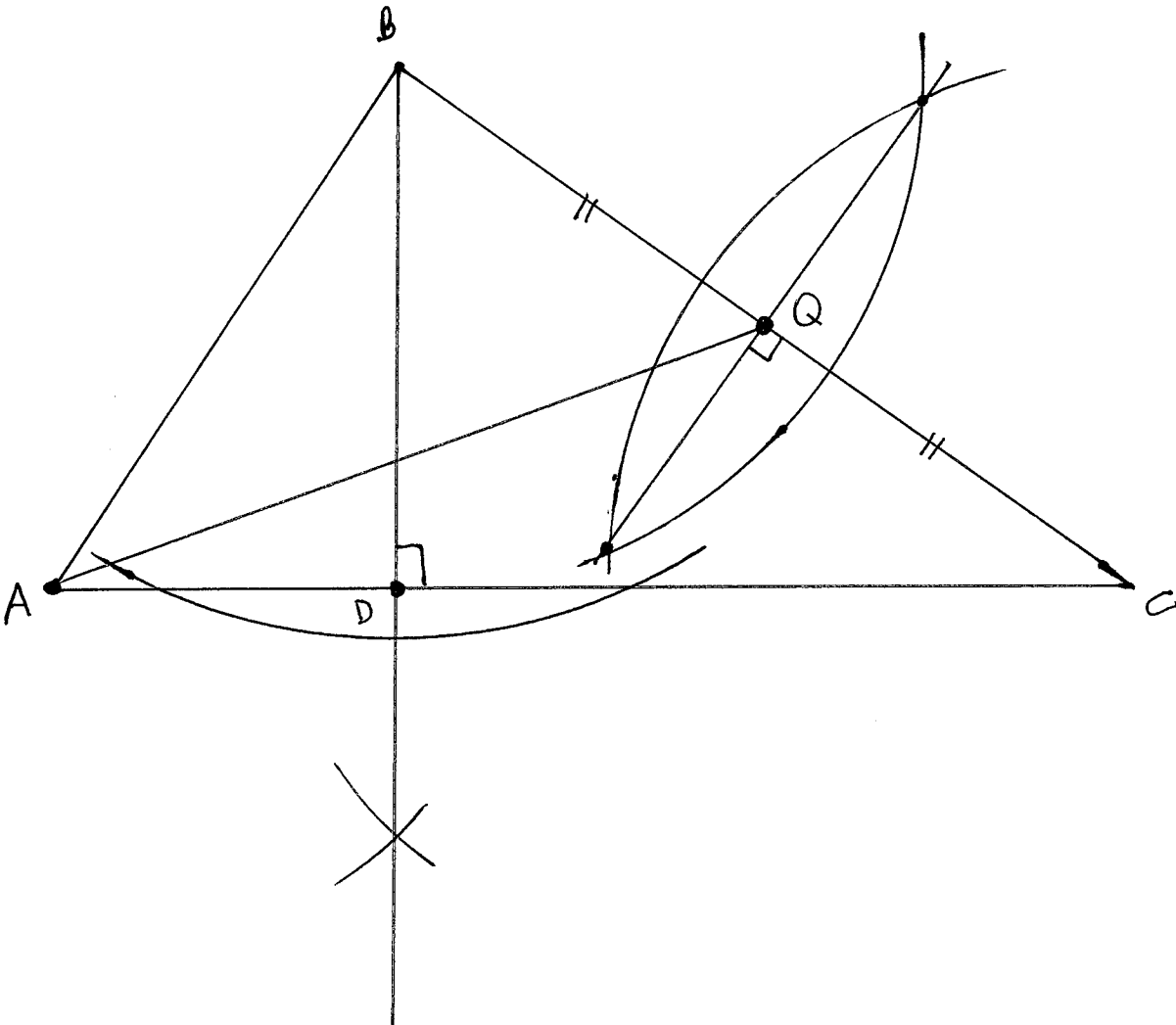
$$\begin{aligned} 2(x+9) &= 4x + 2 \\ 2x + 18 &= 4x + 2 \\ 16 &= 2x & 4(8) + 2 \\ 8 &= x \end{aligned}$$



7. Find the value of x in each figure below.



8. Draw a large scalene $\triangle ABC$ below and then construct median \overline{AQ} and altitude \overline{BD} .



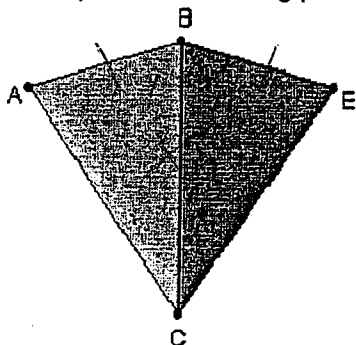


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4.6 - 4.8 Review

1. Complete the following proof.



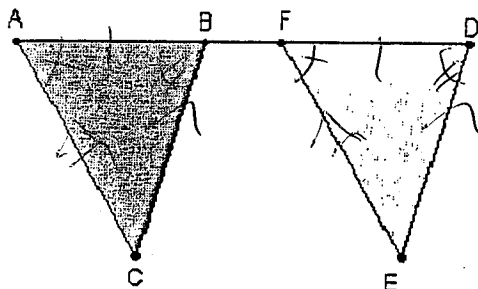
Given: \overline{BC} bisects $\angle ABE$

$\overline{AB} \cong \overline{BE}$

Prove: $\overline{AC} \cong \overline{EC}$

Statements	Reasons
1. \overline{BC} bisects $\angle ABE$	1. Given
2. $\overline{AB} \cong \overline{BE}$	2. Given
3. $\overline{BC} \cong \overline{BC}$	3. reflexive
4. $\angle ABC \cong \angle EBC$	4. def \angle bisector
5. $\triangle ABC \cong \triangle EBC$	5. SAS
6. $\overline{AC} \cong \overline{EC}$	6. CPCTC

2. Complete the following proof.



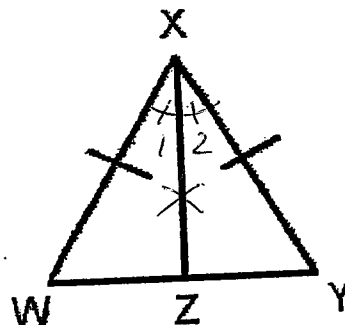
Given: $\overline{BC} \parallel \overline{DE}$, $\overline{AC} \parallel \overline{FE}$

$\overline{AB} \cong \overline{FD}$

Prove: $\triangle ABC \cong \triangle FDE$

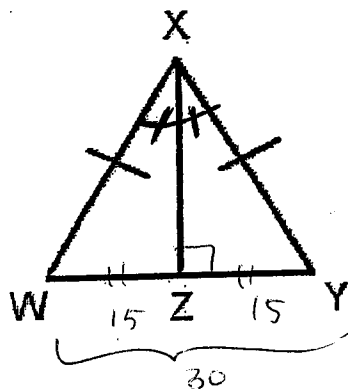
Statements	Reasons
1. $\overline{BC} \parallel \overline{DE}$, $\overline{AC} \parallel \overline{FE}$	1. Given
2. $\overline{AB} \cong \overline{FD}$	2. Given
3. $\angle A \cong \angle D$	3. corresponding \angle 's
4. $\angle C \cong \angle E$	4. corresponding \angle 's
5. $\triangle ABC \cong \triangle FDE$	5. ASA
6.	6.

3. Given: $\overline{WX} \cong \overline{XY}$
 \overline{XZ} bisects $\angle WXY$
 Prove: \overline{XZ} bisects \overline{WY}



Statements	Reasons
① $\overline{WX} \cong \overline{XY}$ \overline{XZ} bisects $\angle WXY$	① Given
② $\angle 1 \cong \angle 2$	② def. of \angle bisector
③ $\overline{XZ} \cong \overline{XZ}$	③ reflexive
④ $\triangle WXZ \cong \triangle YXZ$	④ SAS
⑤ $\overline{WZ} \cong \overline{YZ}$	⑤ CPCTC
⑥ \overline{XZ} bisects \overline{WY}	⑥ def. bisector

4.



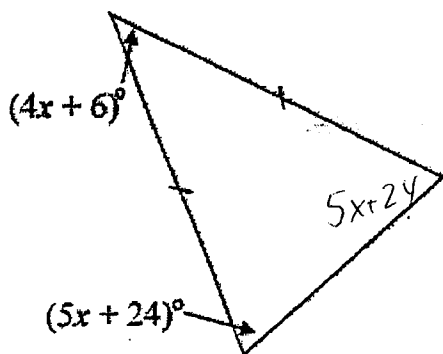
$$WY = 30''$$

$$ZY = 15''$$

$$m\angle YZX = 90^\circ$$

5.

Use the information given in the figure to determine the value of x .



$$2(5x + 24) + 4x + 6 = 180$$

$$14x + 54 = 180$$

$$14x = 126$$

$$x = 9$$