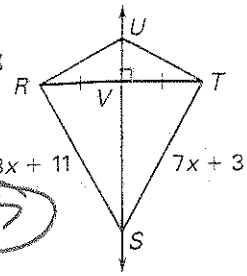
Adv. Geometry 5.2 - Perpendicular Bisectors

Key

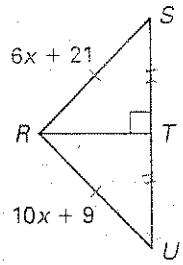
Find the length of $\overline{RS}$.

1.



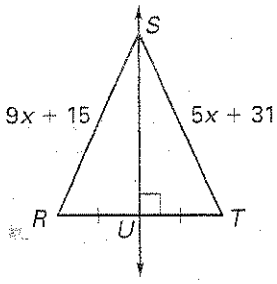
$3x+11=7x+3$
$8=4x$
$2=x$
$RS=17$

2.



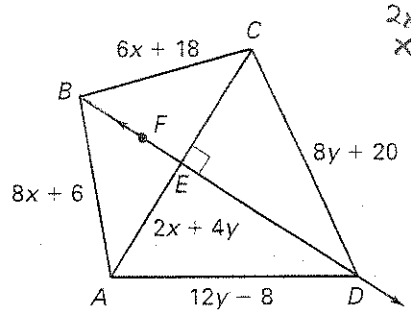
$6x+21=10x+9$
$12=4x$
$3=x$
$RS=39$

3.



$9x+15=5x+31$
$4x=16$
$x=4$
$RS=51$

Use the diagram. $\overline{DE}$ is the perpendicular bisector of $\overline{AC}$. Find the indicated measure.



$8x+6=6x+18$
$2x=12$
$x=6$

$12y-8=8y+20$
$4y=28$
$y=7$

4. Find AB. $=54$

5. Find AE. $=40$

6. Find AD. $=76$

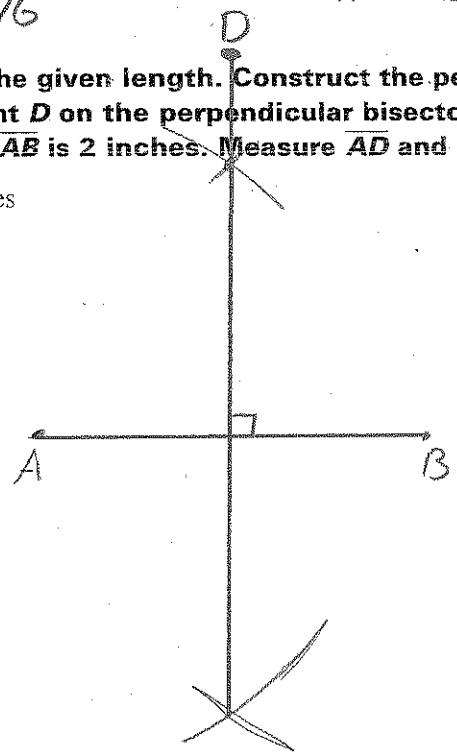
7. Find BC. 54

8. Find AC. $=80$

9. Find CD. $=76$

Draw $\overline{AB}$ with the given length. Construct the perpendicular bisector and choose point D on the perpendicular bisector so that the distance between D and $\overline{AB}$ is 2 inches. Measure $\overline{AD}$ and $\overline{BD}$.

10. $AB = 2$ inches



$\overline{AD}$ measures $2\frac{1}{4}''$

$\overline{BD}$ measures $2\frac{1}{4}''$

In the diagram, the perpendicular bisectors of $\triangle ABC$ meet at point G and are shown dashed. Find the indicated measure.

Given: $AD=20$ $AF=24$
$GC=25$ $BE=15$

13. Find AG. 25

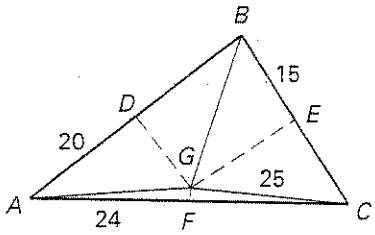
14. Find BD. 20

15. Find CF. 24

16. Find BG. 25

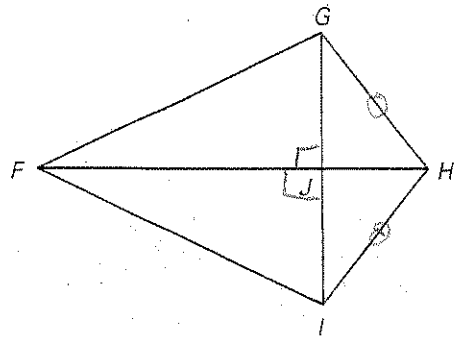
17. Find CE. 15

18. Find AC. 48



15. GIVEN: $\triangle FJG \cong \triangle FJI$

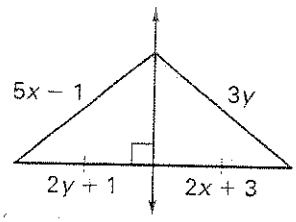
PROVE: $\overline{HI} \cong \overline{HG}$



Statements	Reasons
① $\triangle FJG \cong \triangle FJI$	① Given
② $\angle GJF \cong \angle IJF$	② CPCTC
③ $\angle GJF$ & $\angle IJF$ are Supplementary	③ Def. of Supp.
④ $\angle GJF$ is a rt. $\angle$	④ $\cong$ suppl. $\angle$'s $= 90°$
⑤ $\overline{GJ} \cong \overline{IJ}$	⑤ CPCTC
⑥ $\overline{FJ}$ is Perpendicular bisector	⑥ Def. of $\perp$ bisector
⑦ H is on $\overline{FJ}$	⑦ Given in picture
⑧ $\overline{HG} \cong \overline{HI}$	⑧ Converse of Perp. bisector Theorem

In Exercises 1–4, find the values of *x* and *y*.

1.



$2y+1 = 2x+3$

$-2 = 2x-2y$

$5x-1=3y$

$5x-3y=1$

$\begin{cases} (5x-3y=1)\cdot -2 \\ 2x-2y=-2 \quad \cdot 5 \end{cases}$

$-10x+6y=-2$

$+\ 10x-10y=-10$

$-4y=-12$

$y=3$

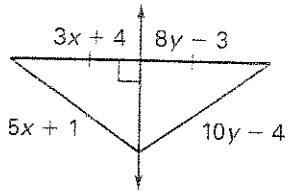
$6+1=2x+3$

$7=2x+3$

$4=2x$

$2=x$

2.



$3x+4=8y-3$

$3x-8y=-7$

$5x+1=10y-4$

$5x-10y=-5$

$\begin{cases} 3x-8y=-7 \quad \cdot -5 \\ 5x-10y=-5 \quad \cdot 3 \end{cases}$

$-15x+40y=35$

$+\ 15x-30y=-15$

$10y=20$

$y=2$

$3x+4=16-3$

$3x+4=13$

$3x=9$

$x=3$