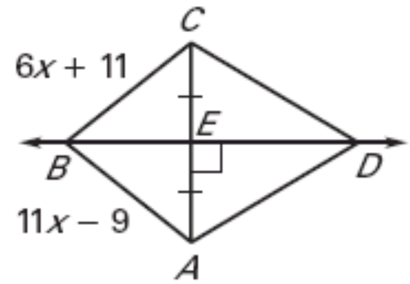
Geometry Name Key
Chapter 5 Review

1. A point on the ⊥ bisector is equidistant from the endpoints of the bisected segment.

2. a. Solve for x. Then determine BC and BA.



x = 4

$6x+11 = 11x-9$
$20 = 5x$
$4 = x$

BC = 35

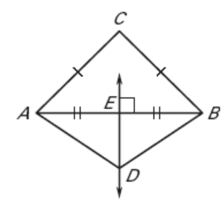
BA = 35

$BC = 6(4)+11 = 24+11 = 35$
$BA = 11(4)-9 = 44-9 = 35$

2b. Is point B on the perpendicular bisector? Explain.

yes because $\overleftrightarrow{BD} \perp \overline{AC}$ and point E is the midpoint of $\overline{AC}$

3. Tell whether the information in the diagram allows you to conclude that *C* is on the perpendicular bisector of $\overline{AB}$. Explain.

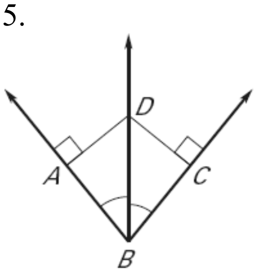


it is because C is equidistant from A and B

4. A point on the angle bisector is equidistant from the Sides of the bisected angle.

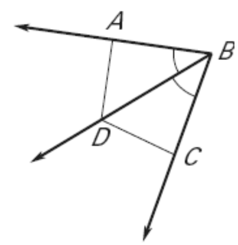
For questions 5 and 6 determine if. $DA = DC$. Explain your reasoning.

5.



yes, because $\overrightarrow{BD}$ is the angle bisector and $\overline{DA}$ and $\overline{DC}$ are the ⊥ distances from D to the sides

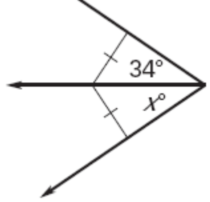
6.



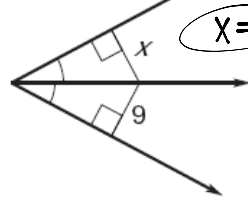
no, while $\overrightarrow{BD}$ is an angle bisector, since there is no right angle at A nor C we do not know that $\overline{DA}$ and $\overline{DC}$ are the ⊥ distances from D to the sides

For questions 7-12 decide if it is possible to determine *x*. If it is possible, explain your reasoning and determine the value of *x*. If it is not possible, explain your reasoning.

7. not possible, we do not know the ⊥ distances are the same

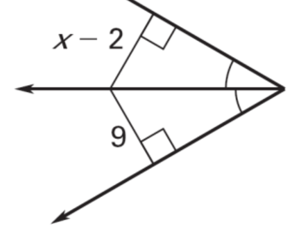


8. possible because it is an angle bisector and $x = 9$ is the ⊥ distance to the sides



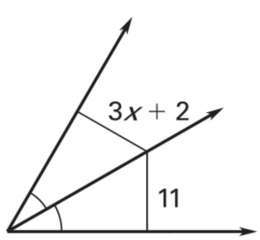
$x = 9$

9. possible because it is an angle bisector and $x-2 = 9$ is the ⊥ distance to the side



$x-2 = 9$
$x = 11$

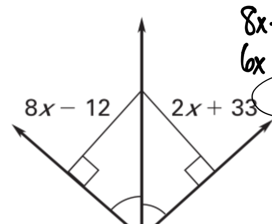
10.



not possible because while it is an angle bisector, we do not know the ⊥ distance to the sides

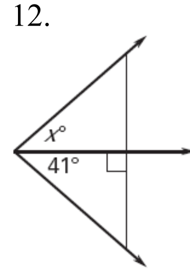
11.

$8x-12 = 2x+33$
$6x = 45$
$x = 7.5$



possible because it is an angle bisector and $8x-12 = 2x+33$ is the ⊥ distance to the sides

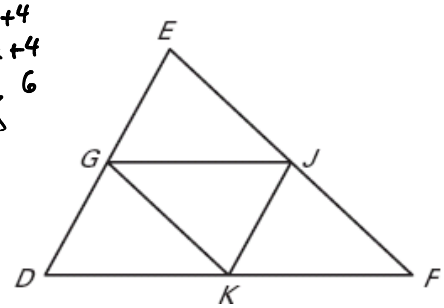
12.



not possible because we do not know if the line is an angle bisector because we do not know if the ⊥ distances to the side are equal

$2 \cdot GK = EF$
$2(4x-1) = 5x+4$
$8x - 2 = 5x + 4$
$3x = 6$
$\boxed{x = 2}$

13. In ΔDEF below, points G, J, and K are midpoints.



a. $\overline{GJ} \parallel$ $\overline{DK}$ or $\overline{KF}$ or $\overline{DF}$

b. $\overline{EJ} \cong$ $\overline{JF}$ $\cong$ $\overline{GK}$

c. $\overline{DE} \parallel$ $\overline{JK}$

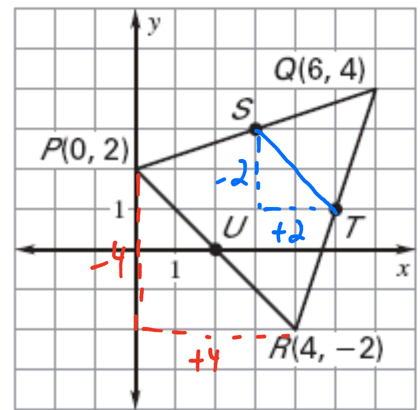
d. $\overline{GJ} \cong$ $\overline{DK}$ $\cong$ $\overline{KF}$

$EJ = GK = 4(2) - 1 = 7$

e. If $GK = 4x - 1$ and $EF = 5x + 4$, determine:

$x =$ 2 $GK =$ 7 $EJ =$ 7 $EF =$ 14

14. Use the graph shown at the right.



a. Prove that $\overline{ST}$ is parallel to $\overline{PR}$.

Slope of $\overline{ST}$:

$\frac{\text{change in } y}{\text{change in } x} = \frac{-2}{2} = -1$

Slope of $\overline{PR}$:

$\frac{\text{change in } y}{\text{change in } x} = \frac{-4}{4} = -1$

Since slopes are equal, the lines are parallel

b. Prove that the length of $\overline{PR}$ is twice the length of $\overline{ST}$.

Length of $\overline{PR}$:

$(-4)^2 + 4^2 = d^2$
$16 + 16 = d^2$
$\sqrt{32} = \sqrt{d^2}$
$5.66 = d$

Length of $\overline{ST}$:

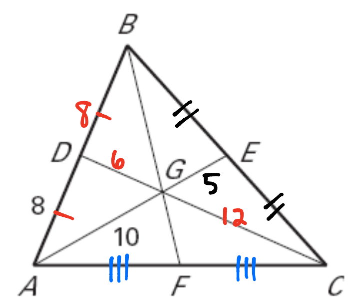
$(-2)^2 + 2^2 = d^2$
$4 + 4 = d^2$
$\sqrt{8} = \sqrt{d^2}$
$2.83 \approx d$

$\Rightarrow$ Since $PR = 5.66$ is two times $ST = 2.83$ we know PR is twice the length of ST

c. Now that you have proven $\overline{ST} \parallel \overline{PR}$ and $PR = 2 \cdot ST$, what type of segment is $\overline{ST}$? What kind of points are points S and T for the triangle?

$\overline{ST}$ is a midsegment because S and T are midpoints

15. Point G is the point of intersection of the three medians of ΔABC. You are given $AD = 8, AG = 10$, and $CD = 18$. Find the length of each segment.



a. $BD =$ 8 (D is a midpoint)

b. $AB =$ 16

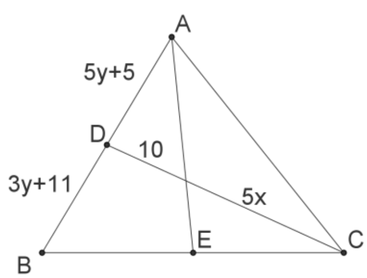
c. $EG =$ 5 (half of $AG = 10$)

d. $AE =$ 15

e. $CG =$ 12 ($\frac{2}{3}$ of CD)

f. $DG =$ 6 ($\frac{1}{3}$ of CD)

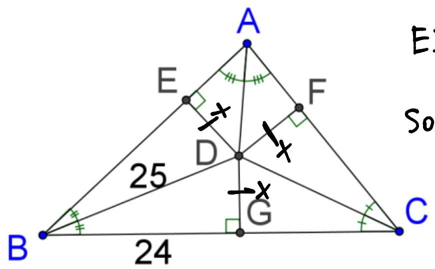
21. $\overline{AE}$ and $\overline{CD}$ are medians of ΔABC. Find the value of x and y.



$5x = 2(10)$
$5x = 20$
$x = 4$

$5y + 5 = 3y + 11$ (midpoint)
$2y = 6$
$y = 3$

22. The angle bisectors of ΔABC intersect at point D. If $BD = 25$ and $BG = 24$, find FD.



ED=DG=FD because any point on an angle bisector is equidistant from the sides and it is showing the ⊥ distance

So if I find DG, I find FD too

using Pythagorean Theorem on △DGB to solve for DG:

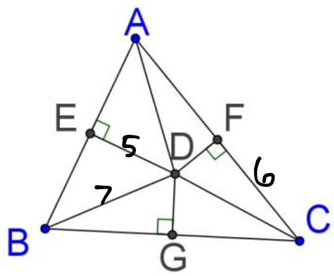
$x^2+24^2=25^2$

$x^2+576=625$

$x^2=49$

$x=7$

23. The perpendicular bisectors of ΔABC meet at point D. If $BD = 7, ED = 5$, and $FC = 6$, find DC.



DA=BB=DC because any point on a ⊥ bisector is equidistant from the endpoints of the bisected segment

thus since DB=7, we know that DC also is 7

24. Given that $\overline{CD}$ is the perpendicular bisector of $\overline{AB}$ with $AB = 16$ and $CD = 15$ determine the following measures.

$m\angle ADC =$ 90°

$AD =$ 8

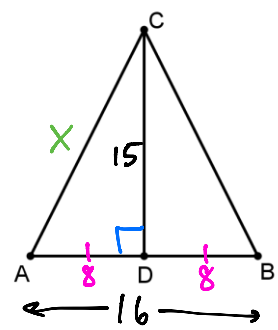
$AC =$ 17

$8^2 + 15^2 = x^2$

$64 + 225 = x^2$

$\sqrt{289} = \sqrt{x^2}$

$17 = x$



25. In the picture you are given that $\overline{AD} \cong \overline{BD}$ and $\angle ACE \cong \angle BCE$. Identify an example of each.

An example of a perpendicular bisector is

$\overline{GD}$

An example of an angle bisector is

$\overline{CE}$

An example of a median is

$\overline{CD}$

An example of an altitude is

$\overline{CF}$