Pop Quiz.
Get out a scrap sheet of paper.

1. What does the midsegment theorem say we know about it's relationship with the third side?

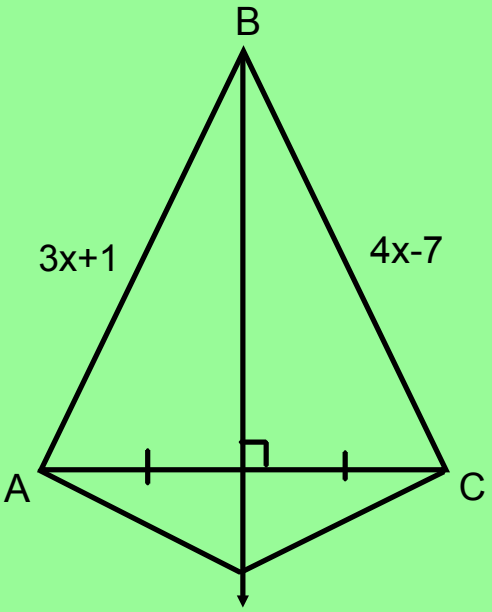
2. What does it mean for lines to be concurrent?

3. What is a circumcenter?

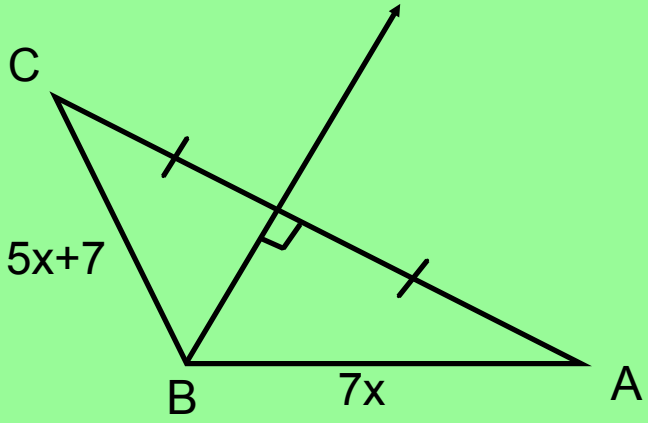
Bellwork
11/09/2011

In problems 1 and 2, find AB.

1.



2.



Geometry
5.3 Use Angle Bisectors of Triangles
Standard(s): 2,3

Vocabulary:

1. Incenter: The point of concurrency of the three angle bisectors of a triangle.

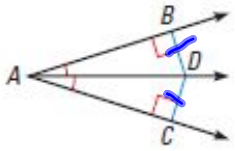
THEOREMS *For Your Notebook*

THEOREM 5.5 Angle Bisector Theorem

If a point is on the bisector of an angle, then it is equidistant from the two sides of the angle.

If $\overrightarrow{AD}$ bisects $\angle BAC$ and $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$, then $DB = DC$.

Proof: Ex. 34, p. 315

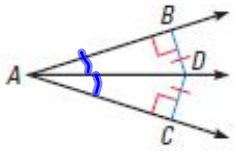


THEOREM 5.6 Converse of the Angle Bisector Theorem

If a point is in the interior of an angle and is equidistant from the sides of the angle, then it lies on the bisector of the angle.

If $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$ and $DB = DC$, then $\overrightarrow{AD}$ bisects $\angle BAC$.

Proof: Ex. 35, p. 315



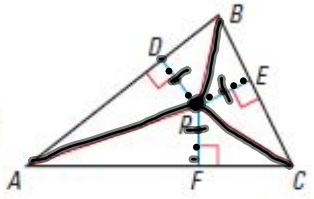
THEOREM *For Your Notebook*

THEOREM 5.7 Concurrency of Angle Bisectors of a Triangle

The angle bisectors of a triangle intersect at a point that is equidistant from the sides of the triangle.

If $\overline{AP}$, $\overline{BP}$, and $\overline{CP}$ are angle bisectors of $\triangle ABC$, then $PD = PE = PF$.

Proof: Ex. 36, p. 316



Incenter

Has to ...

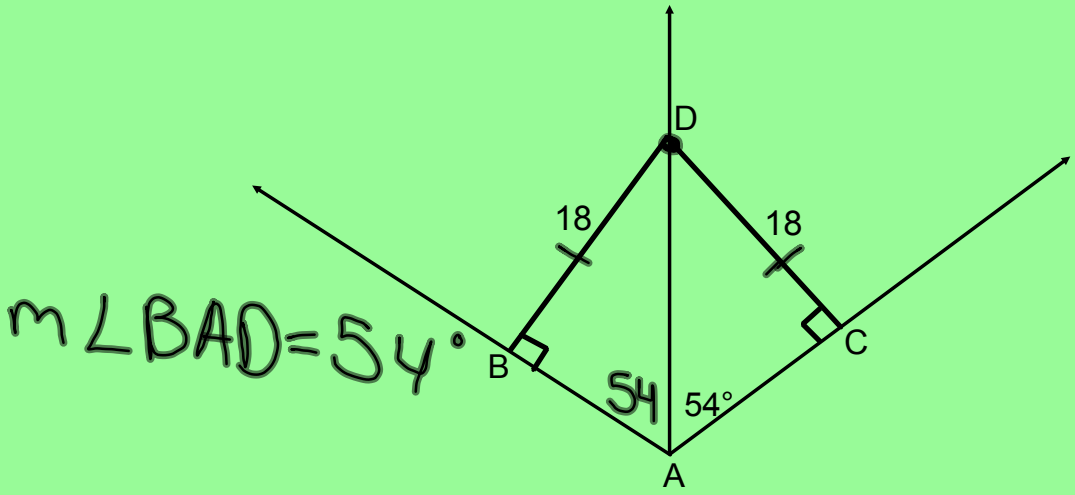
1. Be a point of intersection of the 3∠ bisectors

Is...

1. Equidistant from the sides (⊥)

Use the Angle Bisector Theorems

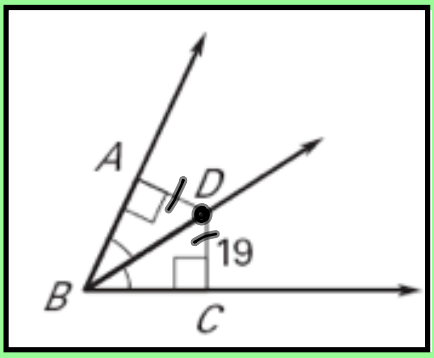
Find the measure of ∠BAD.



m∠BAD=54°

Use the information in the diagram to find the measure.

Find AD.

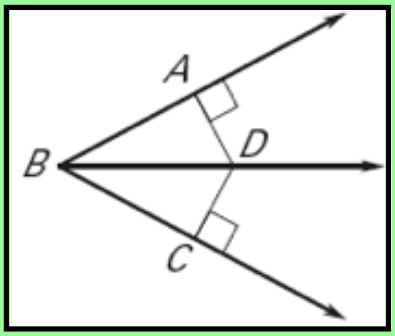


AD=19

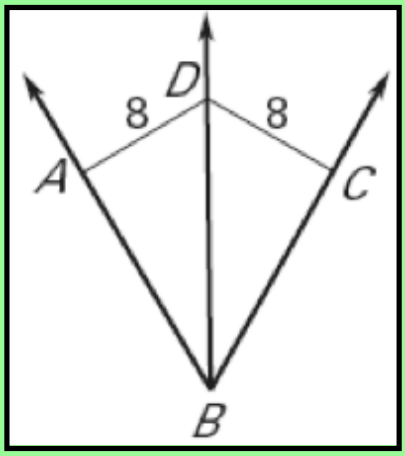
~~Solve a Real-World Problem~~

Can you conclude that $\overrightarrow{BD}$ bisects $\angle ABC$? Explain.

No. Not enough info

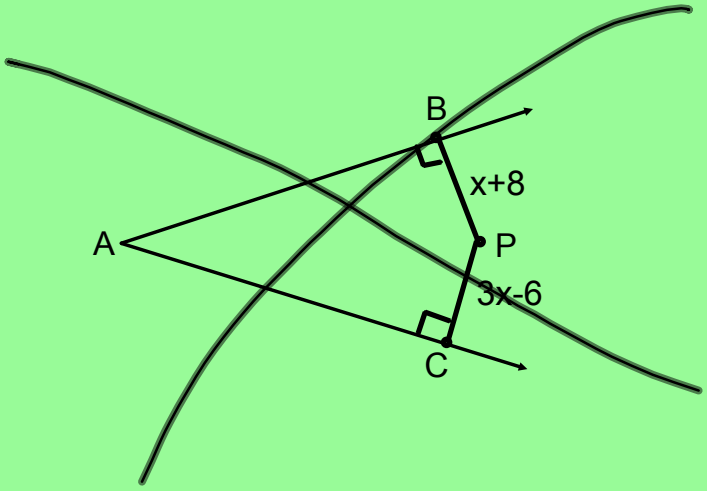


No. We don't know $\overline{DA} \perp \overline{BA}$ & $\overline{DC} \perp \overline{BC}$



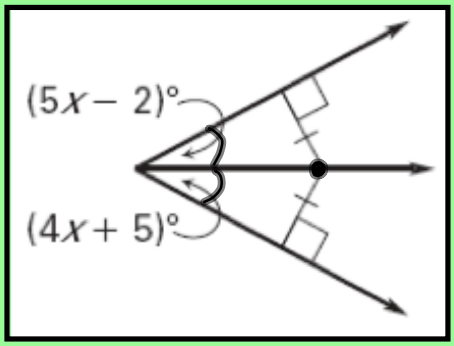
Use Algebra to Solve a Problem

Find the value of *x*.



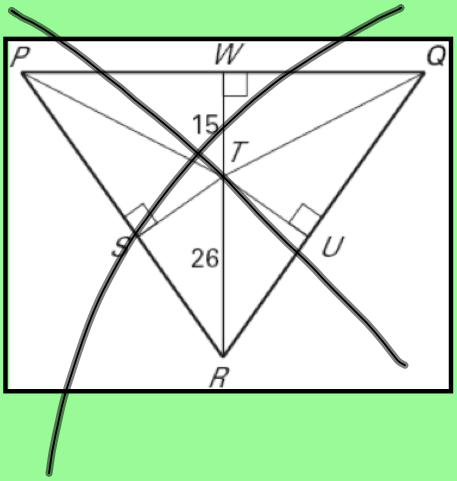
$5x-2=4x+5$

$x=7$



Use the Concurrency of Angle Bisectors

Point *T* is the incenter of ΔPQR. Find *ST*.



In the diagram, G is the incenter of ΔRST. Find GW.

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

$a^2 + 12^2 = 13^2$

$a^2 + 144 = 169$

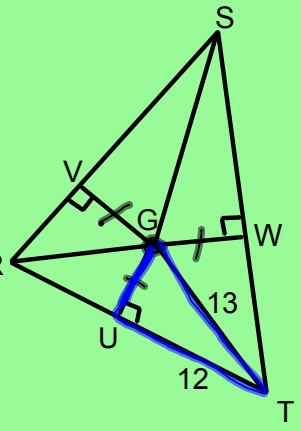
$-144 \quad -144$

$\sqrt{a^2} = \sqrt{25}$

$a = 5$

$GU = 5$

$GW = 5$



Homework Assignment

Worksheet 5.3B