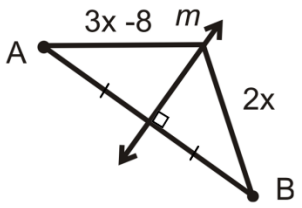
Name: _____Hr:_____ **Section 8.5 Perpendicular Bisectors**

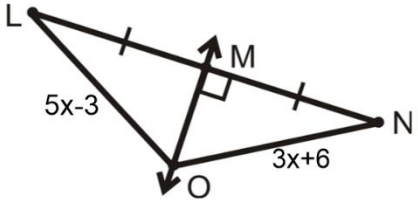
Perpendicular Bisector Theorem: If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.

Converse of the Perpendicular Bisector Theorem: If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.

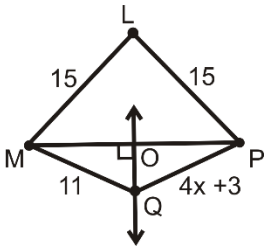
1.



2.

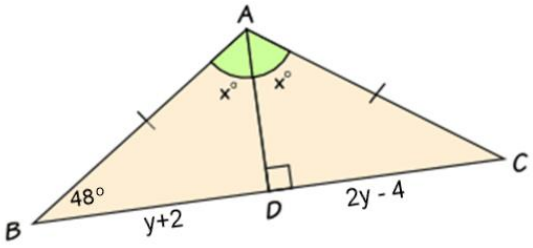


3.

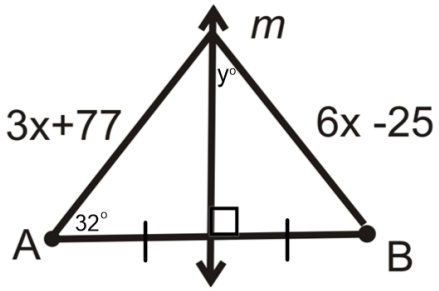


For Questions 4-5 find x and y.

4.

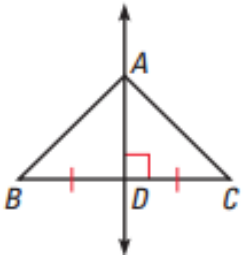


5.



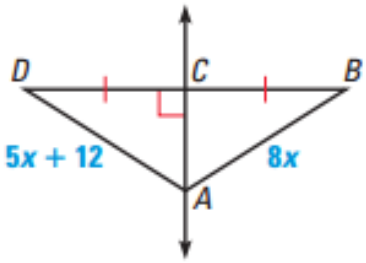
Prove the Perpendicular Bisector Theorem

6. Given: $\overleftrightarrow{AD}$ is the $\perp$ bisector of $\overline{BC}$
   Prove: $AB = AC$



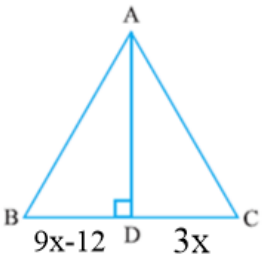
Statement	Reason
1. $\overleftrightarrow{AD}$ is the $\perp$ bisector of $\overline{BC}$	1.
2. $\overline{DB} \cong \overline{DC}$	2.
3. $\angle ADC$ and $\angle ADB$ are right angles	3.
4. $\angle ADC \cong \angle ADB$	4.
5. $\overline{AD} \cong \overline{AD}$	5.
6. $\triangle ADB \cong \triangle ADC$	6.
7. $\overline{AB} \cong \overline{AC}$	7.
8. $AB = AC$	8.

7. Given: $\overleftrightarrow{AC}$ is the $\perp$ bisector of $\overline{DB}$
Prove: $AB = 32$



Statement	Reason
1. $\overleftrightarrow{AC}$ is the $\perp$ bisector of $\overline{DB}$	1.
2. $\overline{AB} = \overline{AD}$	2.
3. $AD = 5x+12$; $AB = 8x$	3.
4. $8x = 5x+12$	4.
5. $3x = 12$	5.
6. $x = 4$	6.
7. $AB = 8(4)$	7.
8. $AB = 32$	8.

8. Given: $AB = AC$
$\angle ADB = 90^\circ$
Prove: $BD = 6$



Statement	Reason
1. $AB = AC$	1.
2. $\overline{AD} \perp \overline{BC}$	2.
3. $\overline{BD} = \overline{DC}$	3.
4. $DC = 3x$ $BD = 9x-12$	4.
5. $9x-12 = 3x$	5.
6. $6x-12 = 0$	6.
7. $6x = 12$	7.
8. $x = 2$	8.
9. $BD = 9(2)-12$	9.
10. $BD = 6$	10.