Geometry NOTES

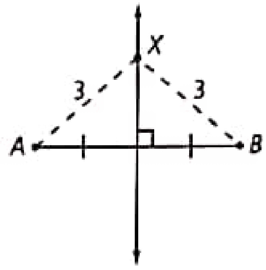
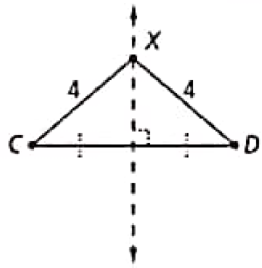
Lesson 5.2:

Perpendicular Bisectors & Angle Bisectors

Key

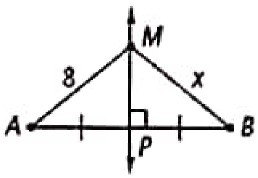
Date: ______

Bisect- cut into 2 equal parts

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

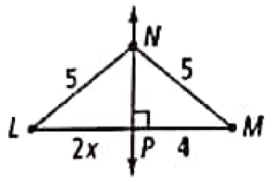
Find the value of x.

1.



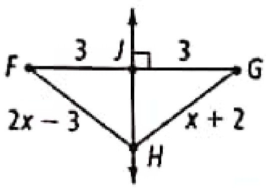
X=8

2.



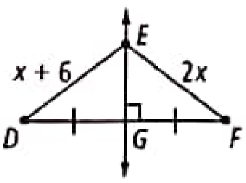
2X=4
X=2

3.



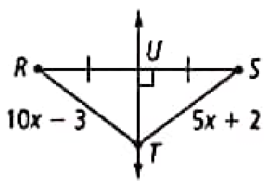
2X-3=X+2
X=5

4.

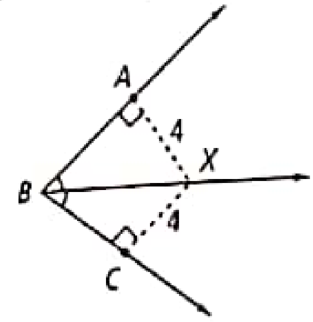
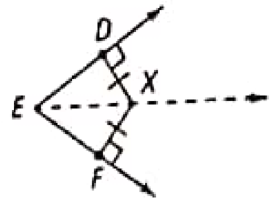


X+6=2X
6=X

5.

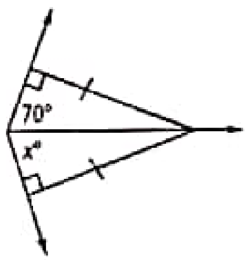


10X-3=5X+2
5X=5
X=1

	Statement of Theorem	Picture or Example
Angle Bisector Theorem	If a point is on the bisector of an angle, then the point is equidistant from the sides of the angle.	
Converse of Angle Bisector Theorem	If a point in the interior of an angle is equidistant from the sides of the angle, then the point is on the angle bisector.	

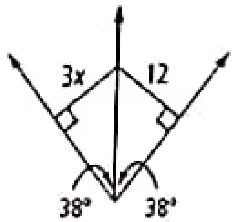
Find the value of x.

7.



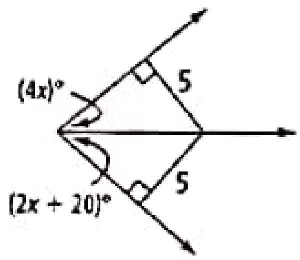
X=70

8.



X=4

9.

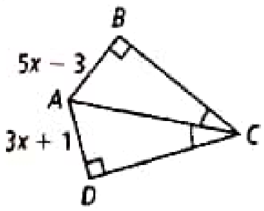


4X=2X+20

2X=20

$\boxed{X=10}$

10.

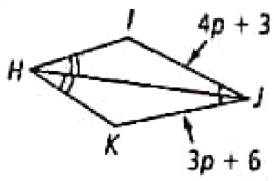


5X-3=3X+1

2X=4

X=2

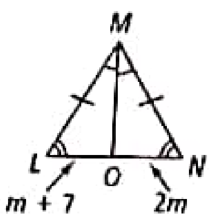
11.



4p+3=3p+6

P=3

12.



m+7=2m

$\boxed{m=7}$

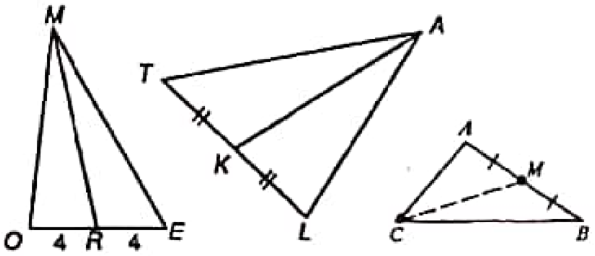
NOTES

Date: ________

Lesson 5.4: Medians & Altitudes of Triangles

Median of a triangle is a segment that runs from one vertex of the triangle to the midpoint of the opposite side. Every triangle has 3 medians.

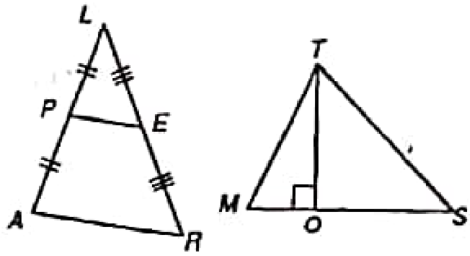
Median of a Triangle



Segments MR and AK are medians.

$\overline{CM}$ is also a median

Not a Median of a Triangle

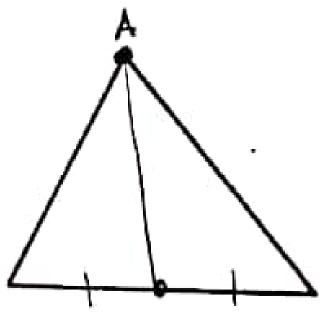


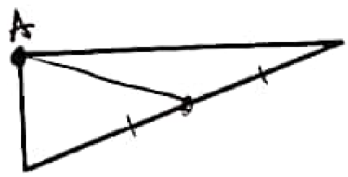
Segments PE and TO are not medians.

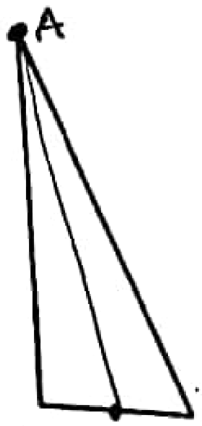
For each example, draw a median from vertex A to the opposite side:

Steps:

1. Find the side across from point A
2. Create a MIDPOINT on that side and label it
3. Connect A to that point



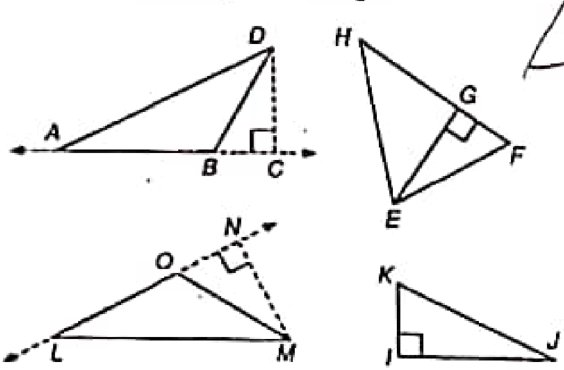


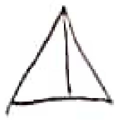


Altitude **of a triangle** is a segment that runs from one vertex perpendicular to the line that contains the opposite side. (i.e. it's height!)

- An altitude may be inside or outside the triangle, or a side of the triangle.
- Every triangle has 3 altitudes

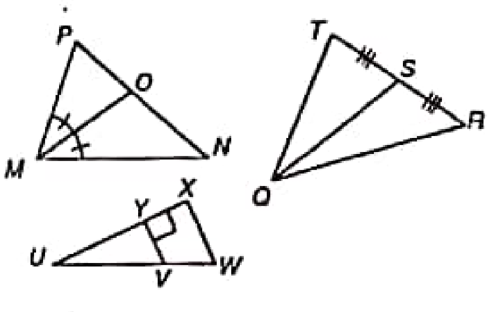
Altitude of a Triangle



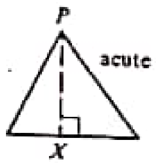


Segments CD, EG, IK, and MN are altitudes.

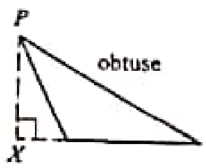
Not an Altitude of a Triangle



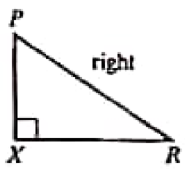
Segments MO, QS, and VY are not altitudes.



In an **acute triangle**, the 3 altitudes will be INSIDE the triangle.



In an **obtuse triangle**, two of the altitudes will be outside the triangle, and only one altitude will be inside the triangle.

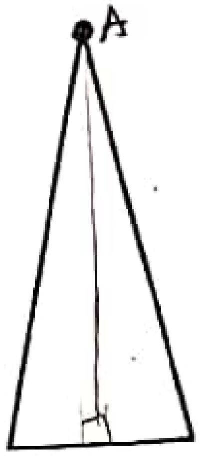


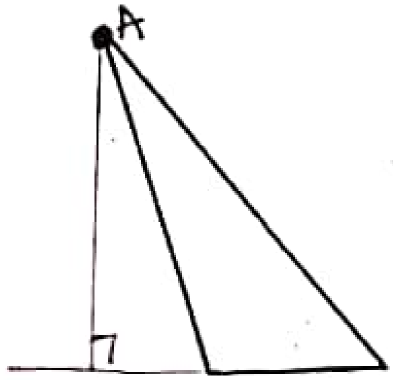
In a **right triangle**, two of the altitudes are the legs of the right triangle (make up the right angle), and one altitude is inside the triangle.

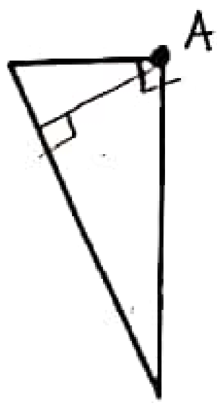
n altitude from vertex A to the opposite side for each triangle below:

ps:

Find the side across from point A
2. If you can create a line that makes a right angle from A to that side, draw your altitude
3. If you cannot, extend the side and then draw your altitude

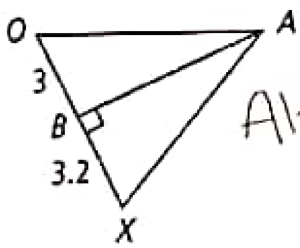






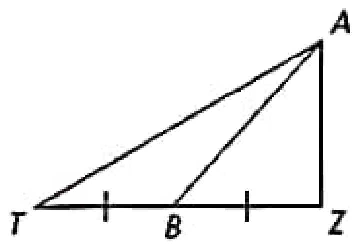
Determine whether AB **is a** ***median***, **an** ***altitude***, **or** ***neither***.

1.



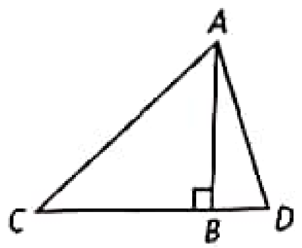
Altitude

2.



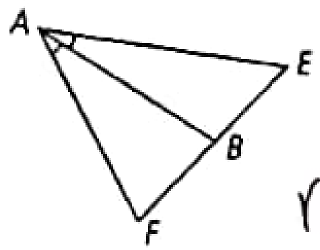
median

3.



Altitude

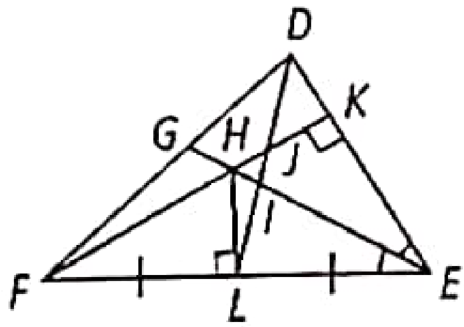
4.



neither

(angle bisecter)

In Exercises 13–16, name each segment.



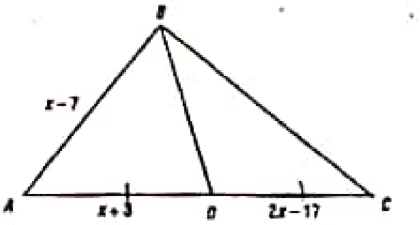
13. a median in ΔDEF $\overline{DL}$

14. an altitude in ΔDEF $\overline{FK}$

15. a median in ΔEHF $\overline{HL}$

16. an altitude in ΔHEK $\overline{EK}$

1. Find AB if $\overline{BD}$ is a median of ΔABC.

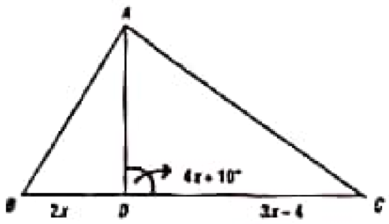


$X+3=2X-17$

$X=20$

$\overline{AB}=13$

2. Find BC if $\overline{AD}$ is an altitude of ΔABC.



40 56

$4X+10=90$

$4X=80$

$X=20$

$\boxed{BC=96}$

~~Let's go to this website and practice identifying segments in a triangle:~~

~~https://www.ixl.com/math/geometry/identify-medians-altitudes-angle-bisectors-and-perpendicular-bisectors~~

~~**HOMEWORK**: Practice Worksheet 5-4~~

~~** Open note quiz tomorrow!~~