

Medians and Altitudes of a Triangle: Altitudes

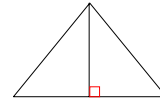
Ms. Laster

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Altitudes of a Triangle

- An altitude of a triangle is the perpendicular segment from a vertex to the opposite side or to the line that contains the opposite side.



Altitudes of a Triangle

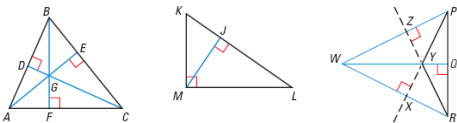
- An altitude of a triangle is the perpendicular segment from a vertex to the opposite side or to the line that contains the opposite side.
- An altitude can lie inside, on, or outside the triangle.

Altitudes of a Triangle

- An altitude of a triangle is the perpendicular segment from a vertex to the opposite side or to the line that contains the opposite side.
- An altitude can lie inside, on, or outside the triangle.
- Every triangle has three altitudes. The lines containing the altitudes are concurrent and intersect at a point called the orthocenter of the triangle.

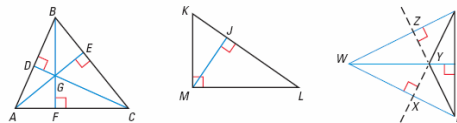
Altitudes of a Triangle

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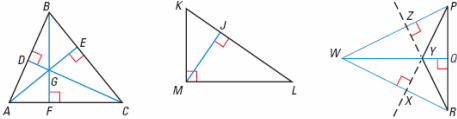
Altitudes of a Triangle

- Theorem 5.8 Concurrency of Altitudes of a Triangle**
 - The lines containing the altitudes of a triangle are concurrent.



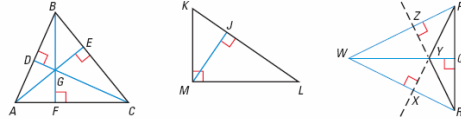
Altitudes of a Triangle

- Acute angles have an orthocenter inside the triangle.



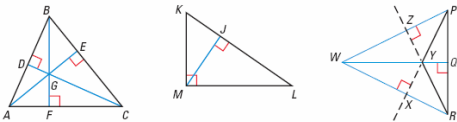
Altitudes of a Triangle

- Right angles have their orthocenter on the triangle.



Altitudes of a Triangle

- Obtuse angles, like $\triangle RYP$, have to have their sides extended in order to draw the altitudes, and the orthocenter is outside the triangle.

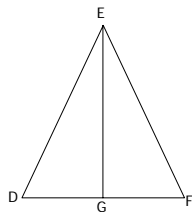


Review

- Perpendicular bisector – perpendicular to a side at its midpoint.
- Angle bisector – bisects the vertex of a triangle.
- Median – goes from a vertex to the midpoint of the opposite side.
- Altitude – perpendicular segment goes from a vertex to the opposite side.

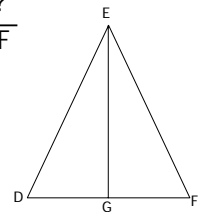
Examples

- Based on the given information, is \overline{EG} a perpendicular bisector, an angle bisector, a median, or an altitude?
- \overline{DG} is congruent to \overline{GF}



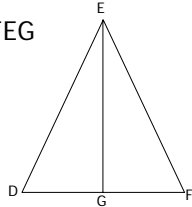
Examples

- Based on the given information, is \overline{EG} a perpendicular bisector, an angle bisector, a median, or an altitude?
- \overline{EG} is perpendicular to \overline{DF}



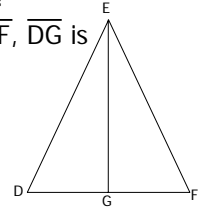
Examples

- Based on the given information, is \overline{EG} a *perpendicular bisector*, an *angle bisector*, a *median*, or an *altitude*?
- $\angle DEG$ is congruent to $\angle FEG$



Examples

- Based on the given information, is \overline{EG} a *perpendicular bisector*, an *angle bisector*, a *median*, or an *altitude*?
- \overline{EG} is perpendicular to \overline{DF} , \overline{DG} is congruent to \overline{FG}



Examples

- Based on the given information, is \overline{EG} a *perpendicular bisector*, an *angle bisector*, a *median*, or an *altitude*?
- $\triangle DGE$ is congruent to $\triangle FGE$

