11/17 Aim: Practice Constructions

Get out your construction supplies.

Homework:
Quest Wednesday

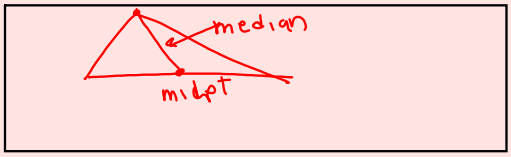
Nov 5-6:19 AM

mathopenref.com
this is a great website for constructions and other topics

Nov 6-6:27 AM

Vocabulary:
median of a triangle

is a line segment that goes from a vertex of the triangle to the midpoint of the opposite side.



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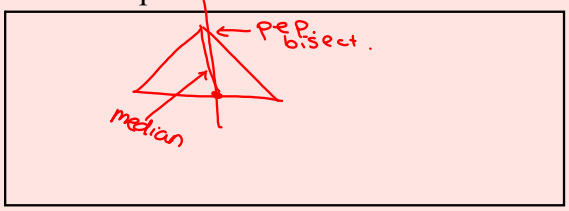
How do you construct a median of a triangle?

A median is drawn by constructing a perpendicular bisector of a side of the triangle locating the midpoint and then drawing a segment from a vertex to the midpoint.



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The CENTROID is the point where the three **medians** of the triangle intersect.

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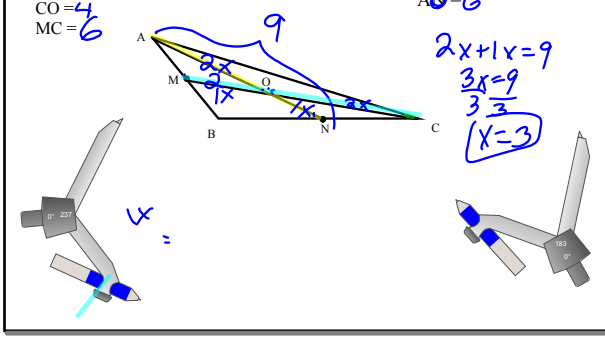
The Centroid divides the median into two parts in a 2:1

OM = 2
CO = 4
MC = 6

AN = 9
ON = 3
AO = 6



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http://www.mathopenref.com/trianglecentroid.html

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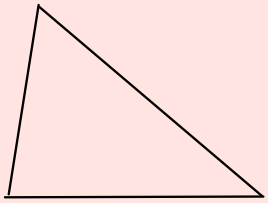
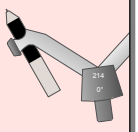
The **centroid** has one very special feature it is known as the center of gravity of the triangle.

Nov 5-6:49 AM

Construct the median of two sides
Locate the centroid.

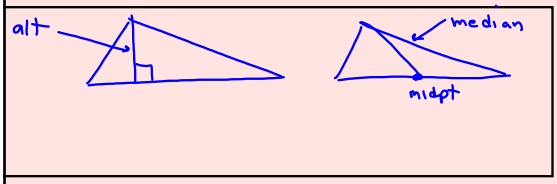




Nov 5-6:34 AM

Vocabulary:
Altitude of a triangle

is a line segment that goes from a vertex perpendicular to the opposite side of a triangle.



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How do you construct an altitude of a triangle?

Construct a perpendicular line from a point not on the line.

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The orthocenter is the point where the three **altitudes** of the triangle intersect.

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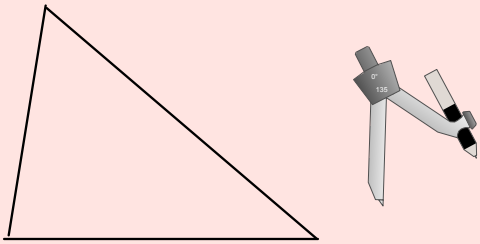
http://www.mathopenref.com/triangleorthocenter.html

What is a special feature that happens in an orthocenter? Watch closely.

Nov 5-7:07 AM

Draw a scalene triangle
construct two altitudes for the triangle



Nov 5-6:40 AM

Vocabulary:
Angle bisector

is a segment that divides an angle into two congruent angles

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The incenter is the point where the three angle bisectors of the triangle intersect.

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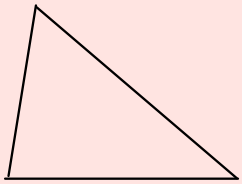
Draw a scalene triangle
construct three angle bisectors for the triangle



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The incenter is the center of the triangle's incircle, the largest circle that will fit inside the triangle and touch all three sides.

http://www.mathopenref.com/triangleincenter.html

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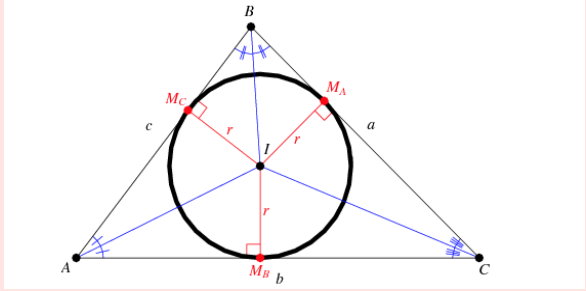

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Can the point of intersection every fall outside of the triangle?
Under what circumstances would this happen?

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The Circumcenter is the point where the three **perpendicular bisectors** of the triangle intersect.

the circle that passes through all three of the triangle's vertices. As you reshape the triangle above, notice that the circumcenter may lie outside the triangle.

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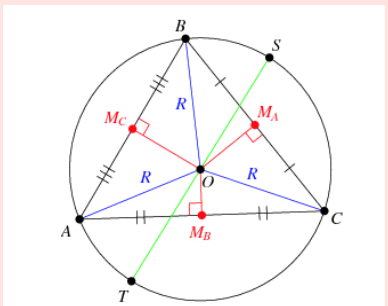
http://www.mathopenref.com/trianglecircumcenter.html

The circumcenter is also the center of the triangle's circumcircle - the circle that passes through all three of the triangle's vertices.

Nov 6-7:14 AM



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In the case of an equilateral triangle, *all four* of the above centers occur at the same point.

Nov 5-7:09 AM

The Euler line - an interesting fact

It turns out that the orthocenter, centroid, and circumcenter of any triangle are collinear - that is, they always lie on the same straight line called the Euler line, named after its discoverer.

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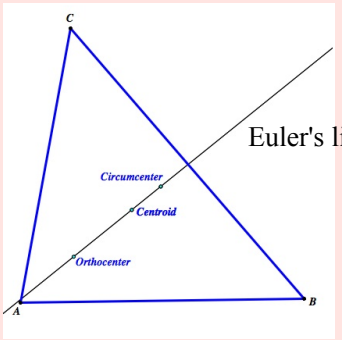

Euler's line

Nov 6-6:26 AM

1) In what type of triangle is the point of concurrency inside a triangle the same for the incenter, circumcenter, orthocenter, and centroid?
1) obtuse 2) isosceles 3) equilateral 4) scalene

2) What point of concurrency in a right triangle is also the midpoint of the hypotenuse?
1) circumcenter 2) centroid 3) incenter 4) orthocenter

3) The circumcenter of a triangle is also the center of
1) mass and balance
2) a circle circumscribing the triangle
3) a circle inscribed inside the triangle
4) all of the above

4) The incenter of a triangle is also the center of
1) mass and balance
2) a circle circumscribing the triangle
3) a circle inscribed inside the triangle
4) all of the above

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5) What point of concurrency in a triangle divides the medians into segments whose measures are in the ratio of 2:1?
1) orthocenter 2) centroid 3) incenter 4) circumcenter

6) What point of concurrency in a triangle is *always* located inside the triangle?
1) orthocenter and circumcenter
2) incenter, only
3) orthocenter, only
4) centroid and incenter

7) The centroid of a triangle is also the center of
1) mass and balance
2) a circle circumscribing the triangle
3) a circle inscribed inside the triangle
4) all of the above

8) In what type of triangle is the orthocenter located outside of the triangle?
1) equilateral 2) obtuse 3) acute 4) right

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1) The centroid of a triangle is the point of concurrency of what lines of a triangle?
1) bisectors of the angles
2) altitudes
3) perpendicular bisectors of the sides
4) medians

___ 2) The circumcenter of a triangle is the point of concurrency of what lines of a triangle?
1) medians
2) perpendicular bisectors of the sides
3) altitudes
4) bisectors of the angles

___ 3) The incenter of a triangle is the point of concurrency of what lines of a triangle?
1) medians
2) perpendicular bisectors of the sides
3) bisectors of the angles
4) altitudes

___ 4) The orthocenter of a triangle is the point of concurrency of what lines of a triangle?
1) medians
2) perpendicular bisectors of the sides
3) altitudes
4) bisectors of the angles

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__ 5) The midpoint of the hypotenuse of a right triangle is also the
1) orthocenter
2) circumcenter
3) incenter
4) centroid

__ 6) It is possible for which of the following points to lie in the exterior region of a triangle?
1) circumcenter and centroid, only
2) circumcenter, only
3) orthocenter, only
4) orthocenter and circumcenter, only

__7) The circumcenter of a triangle is also the center of
1) mass and balance
2) a circle circumscribing the triangle
3) a circle inscribed inside the triangle
4) all of the above

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__8) The incenter of a triangle is also the center of
1) mass and balance
2) a circle circumscribing the triangle
3) a circle inscribed inside the triangle
4) all of the above

__9) What point of concurrency in a triangle divides the medians into segments whose measures are in the ratio of 2:
1) orthocenter
2) centroid
3) incenter
4) circumcenter

__10) The centroid of a triangle is also the center of
1) mass and balance
2) a circle circumscribing the triangle
3) a circle inscribed inside the triangle
4) all of the above

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