Triangle Centres

March 7/2011

There is more than one centre for triangles.

The **centroid** is the intersection point of the **medians**.

The **orthocentre** is the intersection point of the **altitudes**.

The **circumcentre** is the intersection point of the **perpendicular bisectors**.

The **incentre** is the intersection point of the **angle bisectors**. *** will not be evaluated ***

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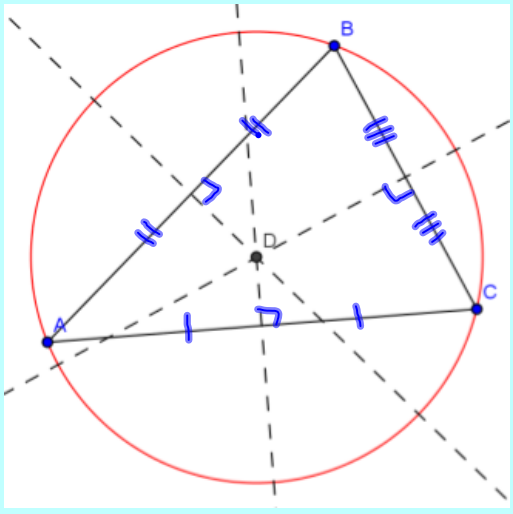
The **centroid** is also known as the centre of mass of the triangle. You could balance the triangle at this point.

The **circumcentre** is the point that is equidistant from all 3 vertices of the triangle.

or

It the centre of the circle that passes through each vertex of the triangle.



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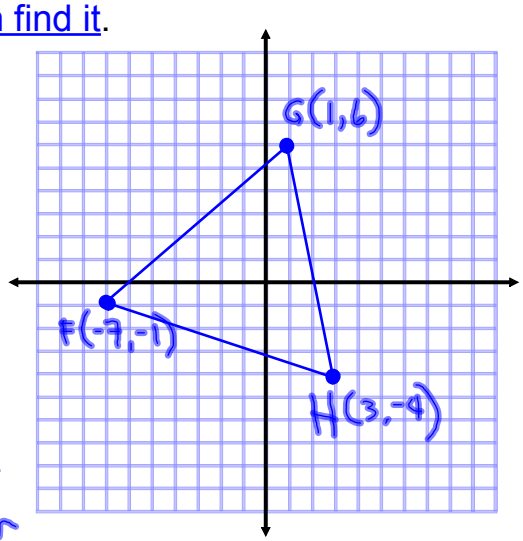
Given triangle FGH with vertices at F(-7,-1), G(1,6), and H(3,-4):

a) List the steps required to determine the coordinates of the circumcentre, and then find it.
(draw a sketch first!)



① find the midpoints of two sides
② find slopes of same two sides
③ find $m_{\perp}$ for 2 sides
④ find equation of each perpendicular bisector
⑤ solve two equations for circumcentre
⑥ find 3rd line and verify point

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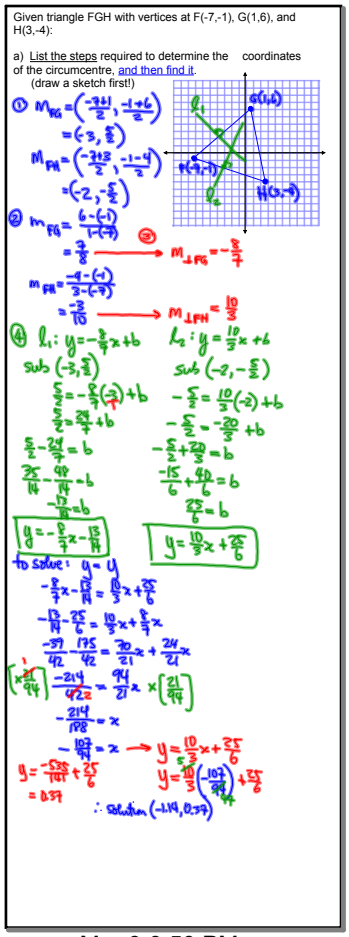

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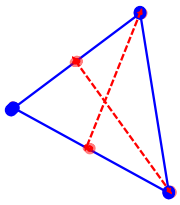
b) List the steps required to determine the coordinates of the centroid.

→ intersection of medians

midpoint to vertex.



① find midpoints of 2 sides

② use vertex opposite each side and MP to find
(a) slope
(b) y-int
] equation of each median

③ solve system of equations (medians) for the centroid.

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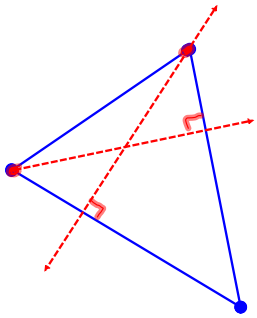
c) List the steps required to determine the coordinates of the orthocentre.

intersection of altitudes

→ perpendicular lines passing through each vertex



① find slopes of 2 sides

② neg. reciprocals → slopes of altitudes

③ y-int of altitudes using vertex as point
→ equation of altitudes

④ solve system for orthocentre.

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Assigned Work:

p.120-121 # 6, 8, 9, 10

Triangle ABC has vertices A(3, 4), B(-5, 2) and C(1, -4).
Find the coordinates of the
a) circumcentre. Answer: (-2/5, 3/5)
b) orthocentre. Answer: (-1/5, 4/5)
c) centre of mass (centroid). Answer: (-1/3, 2/3)

Test will be Friday:
Review:

p124-125 #1, 2, 3, 6, 7, 8, 9, 10, 11, 13,
15, 16, 18, 20a, 21, 22, 23

Feb 28-12:00 PM