Triangle Centres

March 7/2016

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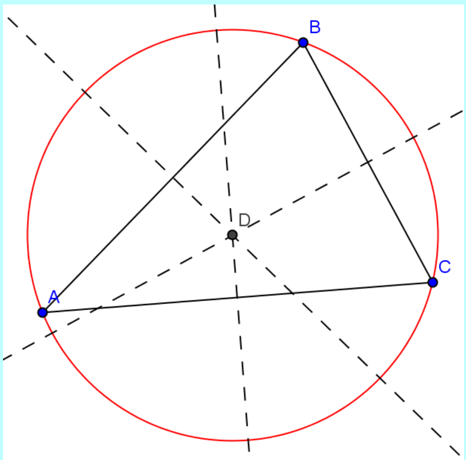
The **centroid** is also known as the centre of mass of the triangle. You could balance the triangle at this point.

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(-2,7), G(10,1), and H(1,10):

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

b) <u>List the steps</u> required to determine the coordinates of the centroid. (draw a sketch... maybe a new one)

c) <u>List the steps</u> required to determine the coordinates of the orthocentre.

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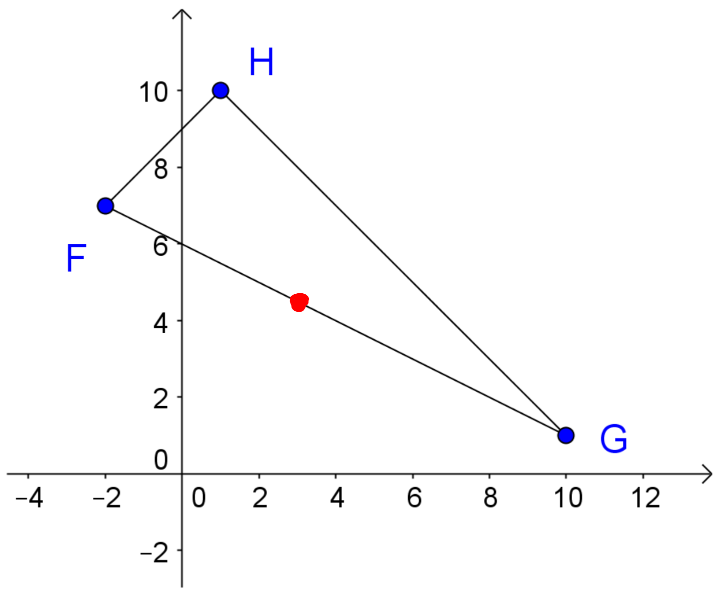
Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)



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Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)

Steps (for side FG):

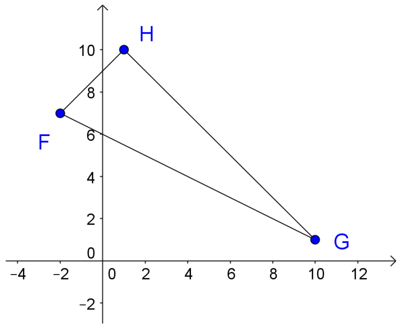
(1) midpoint of FG

(2) slope of FG

(3) perpendicular slope to FG

(4) equation of perpendicular line (missing y-int)

(5) substitute midpoint to solve for 'b', the y-int



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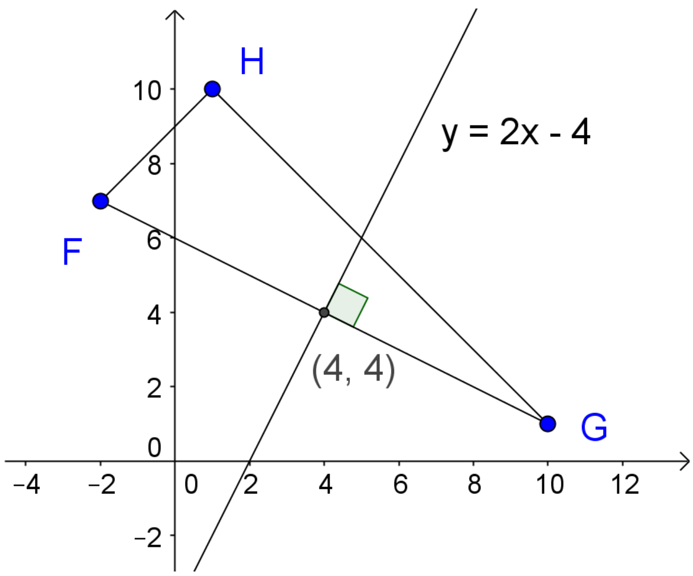
Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)

For side FG:

$y = 2x - 4$



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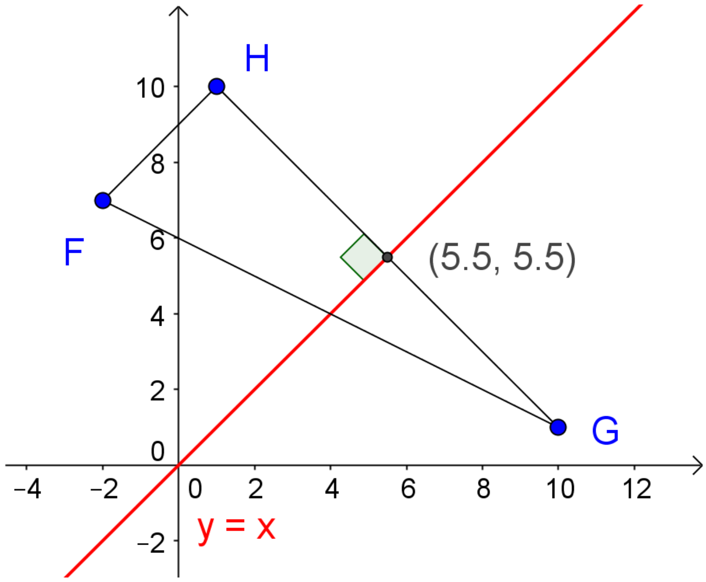
Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)

For side GH:

y = x



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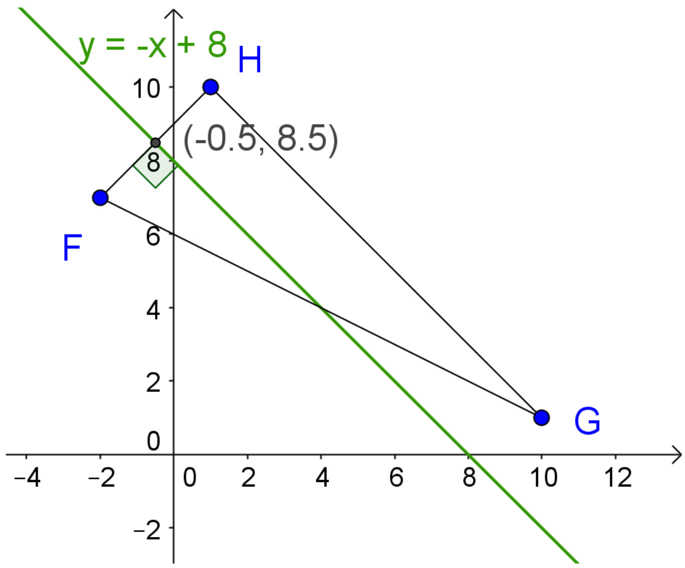
Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)

For side FH:

y = -x + 8



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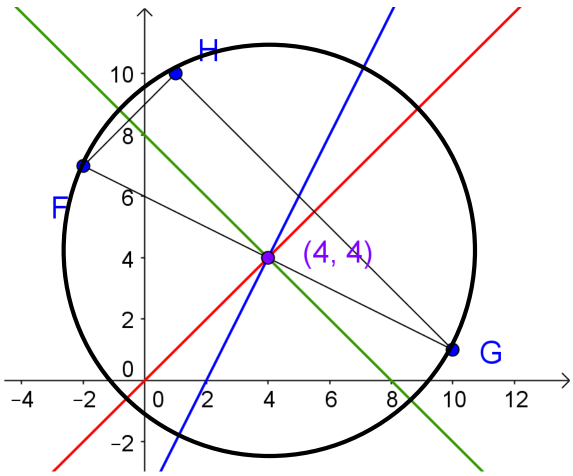
Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)

The circumcentre is the intersection of the perpendicular bisectors.

Only two of three are required, but the third is a good check.

Solution: (4,4)



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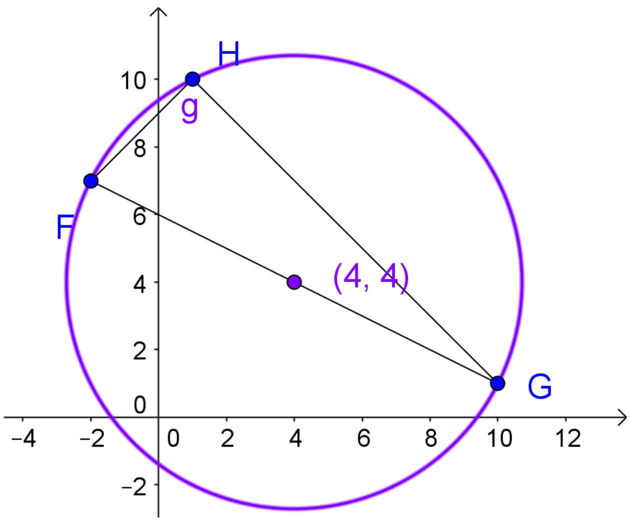
Given triangle FGH with vertices at F(-2,7), G(10,1), and H(1,10):

(a) Circumcentre (perpendicular bisectors)

The circumcentre is the also the center of the circle which passes through all three of the vertices



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Assigned Work:

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

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)

Review:

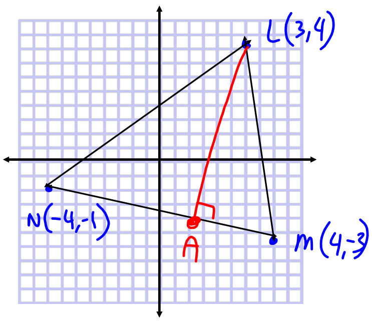
p124-125 #1, 2, 3, 6, 7, 8, 9, 10, 11, 13,
15, 16, 18, 20a, 21, 22, 23

Feb 28-12:00 PM

$A_{\Delta} = \frac{1}{2}bh$

base:

$b = d_{MN}$



height:

① slope MN

② $m_{\perp} = m_{LA}$

③ $y = m_{\perp}x + b$?

④ sub L, solve for b

equation of altitude

equation of base

m_{MN} ✓

$y = m_{MN}x + b$

Sub M or N, solve for b

equation of base

solve for point of intersection
(substitution or elimination)

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