Triangle Centers

Point of concurrency of the ...	Δ Center Name	Δ Circle Name	Equidistant from...
⊥ bisectors	circumcenter	circumscribed circle	the vertices
∠ bisectors	incenter	inscribed circle	the sides
medians	centroid		
altitudes	orthocenter		

Theorem 5-6

The ⊥ bisectors of a Δ are concurrent at a point equidistant from the vertices.

The POC for Δ ⊥ bisectors is the circumcenter

circumcenter is equidist from Δ sides

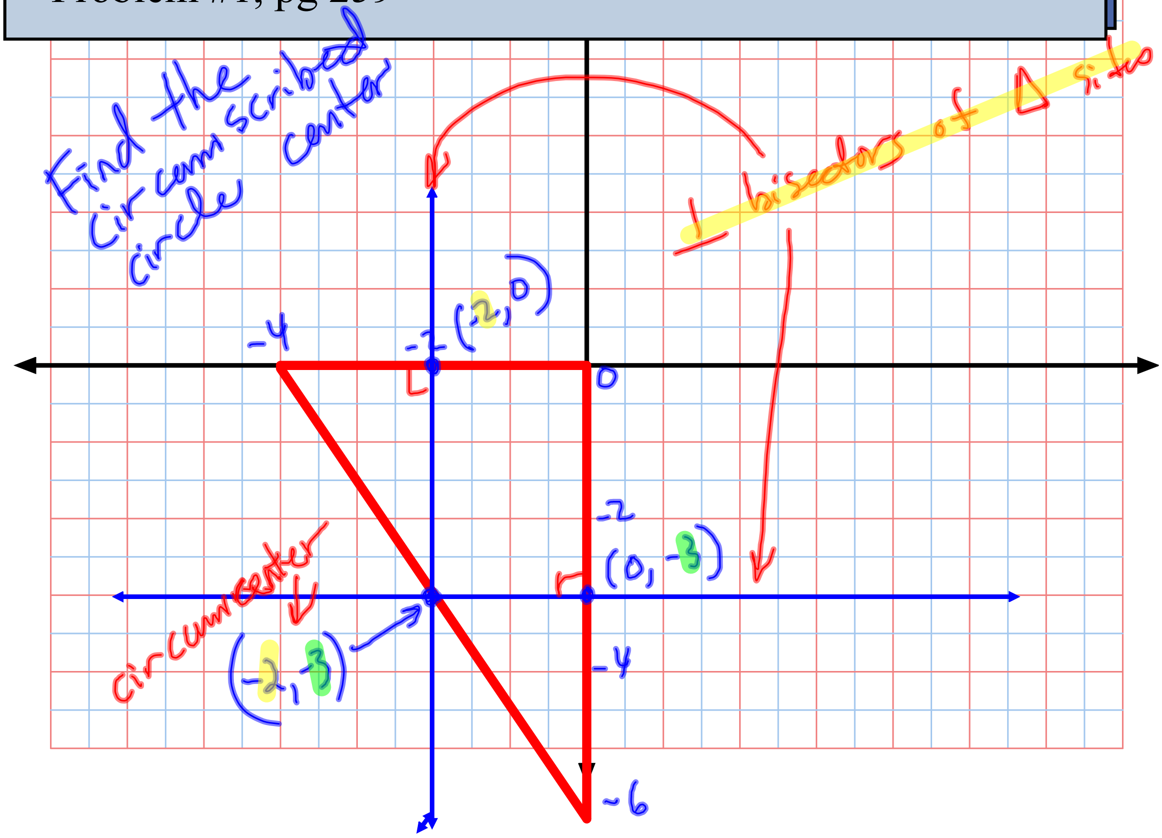
↓

circle

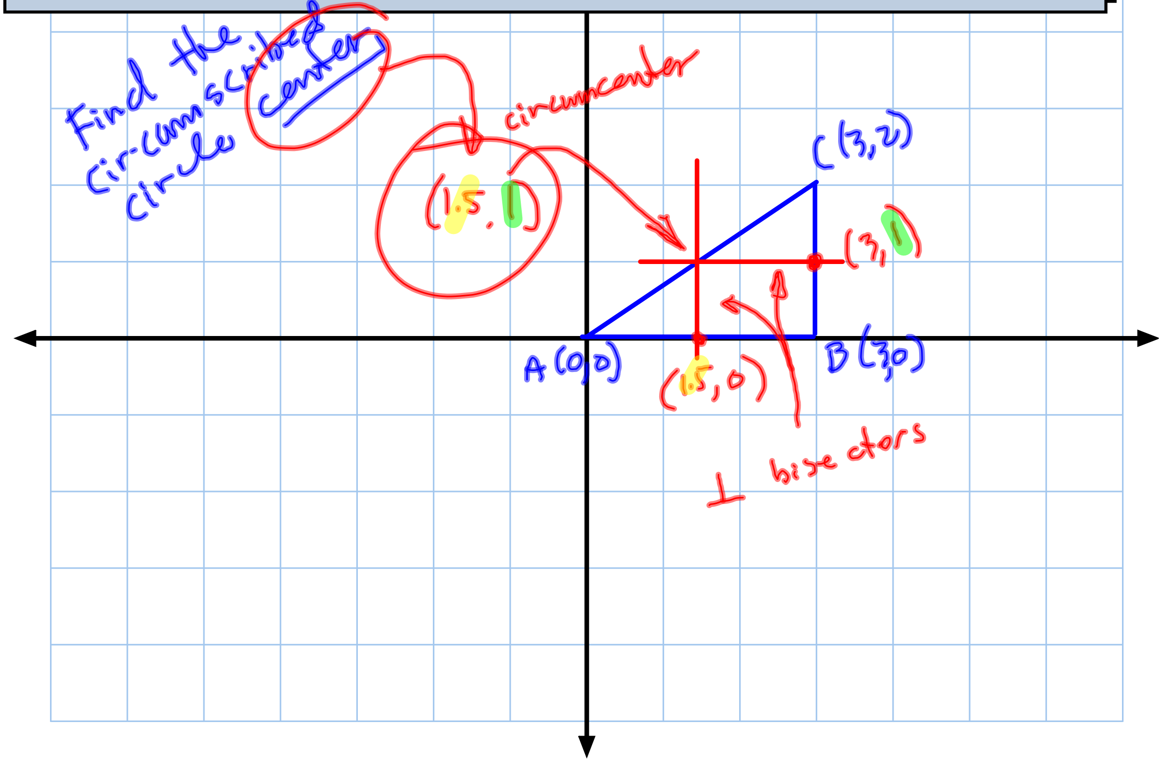
↓

circumcircle

Problem #1, pg 259



Problem #3, pg 259 $A(0, 0)$, $B(3, 0)$, $C(3, 2)$



Theorem 5-7

The ∠ bisectors of a Δ are concurrent at a point equidistant from the sides.

The POC for Δ's ∠ bis is the in center

In center is equidist frm sides

↓

circle

↓

in circle

Theorem 5-8

The medians of a Δ are concurrent at a point that is $^{2}/_{3}$ dist from each vertex to the midpt of the opp side.

The POC for Δ medians is the centroid

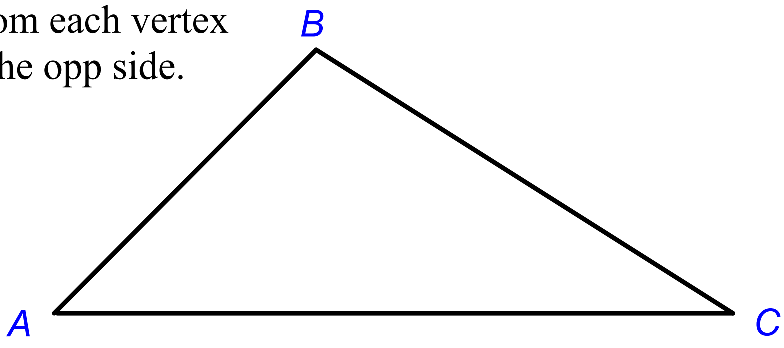
↓

"center of gravity" for the Δ

- No circle -

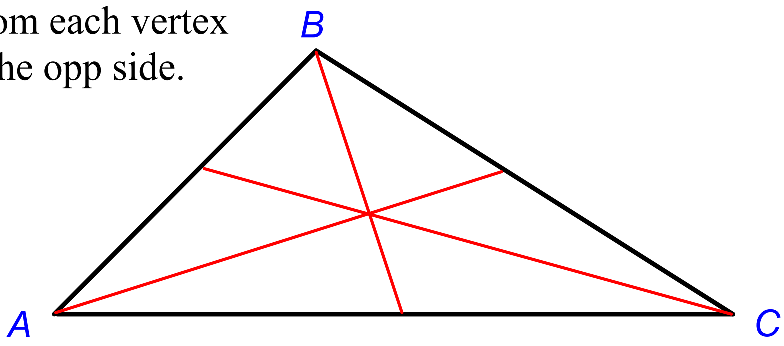
Theorem 5-8

The medians of a Δ are concurrent at a point that is $^2/_3$ dist from each vertex to the midpt of the opp side.



Theorem 5-8

The medians of a Δ are concurrent at a point that is $^2/_3$ dist from each vertex to the midpt of the opp side.



Theorem 5-8

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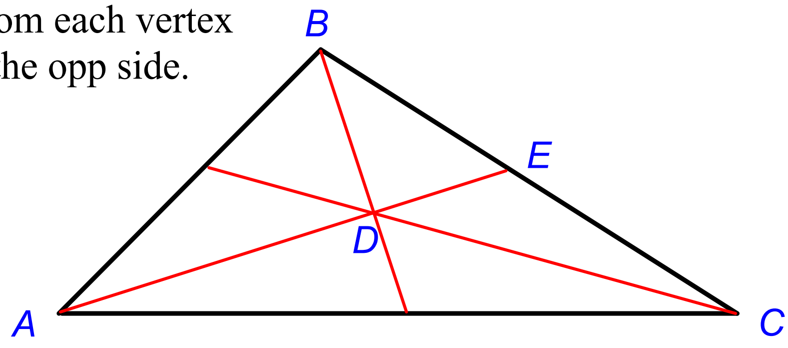
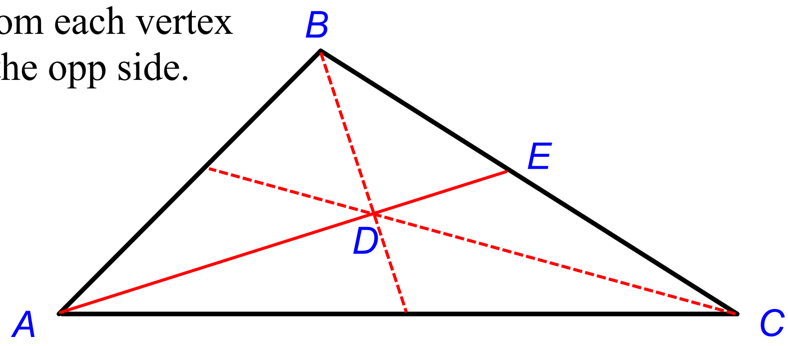


Theorem 5-8

The medians of a Δ are concurrent at a point that is $^2/_3$ dist from each vertex to the midpt of the opp side.

$AD = {}^2/_3$??

$DE = {}^1/_3$??

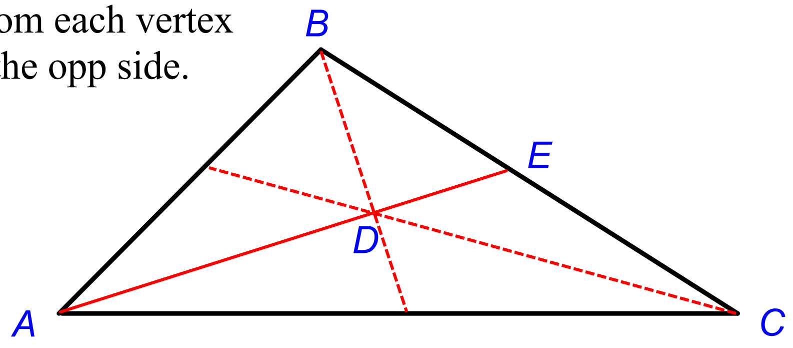


Theorem 5-8

The medians of a Δ are concurrent at a point that is $^2/_3$ dist from each vertex to the midpt of the opp side.

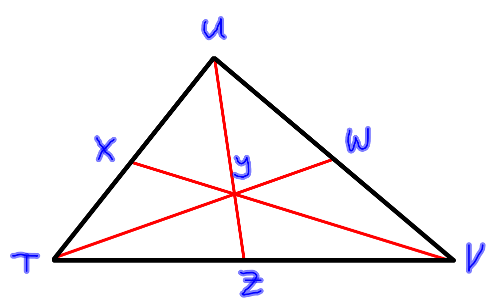
$AD = {}^2/_3\ AE$

$DE = {}^1/_3\ AE$



Problem #11, pg 260

If $YW = 9$, find TY & TW.



$YW = \frac{1}{3} TW$

$TY = \frac{2}{3} TW$

$9 = \frac{1}{3} TW$

$TW = 27$

$TY = \frac{2}{3}(27)$

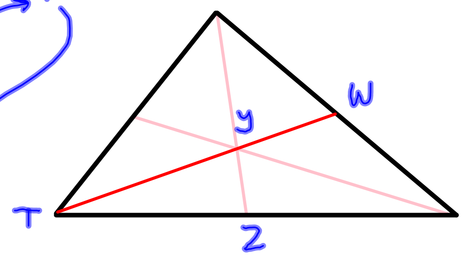
$TY = 18$

Problem #23, pg 260

Seg 1 : $Ty \rightarrow Ty = \frac{2}{3}TW \rightarrow TW = \frac{3}{2}Ty$

Seg 2 : $yW \rightarrow yW = \frac{1}{3}TW \rightarrow TW = 3yW$

Looking for $\frac{\text{Seg1}}{\text{Seg2}}$ or $\frac{Ty}{TW}$



$TW = TW$

so

$\frac{3}{2}Ty = 3yW \rightarrow \cancel{\frac{2}{3}}\left(\cancel{\frac{3}{2}}Ty\right) = (\cancel{3}yW)\frac{2}{\cancel{3}}$

$\frac{Ty}{yW} = \frac{2yW}{yW}$

$\frac{Ty}{yW} = \frac{2}{1}$ or $2:1$

Theorem 5-9

The lines containing the altitudes of a Δ are concurrent.

The POC for Δ alts is the orthocenter

– no circle –

L5-3 HW Problems

Pg 259 #1-15,
19-22,
27-29,
37-39