**Assignment #4**
Another triangle, another centre ...
Due on Friday, 7 March, 2014.

The *altitude* from vertex A of $\triangle ABC$ is the line from A to the opposite side BC of the triangle that is perpendicular to BC. The altitudes from the other vertices of the triangle are defined similarly.

1. Given $\triangle ABC$, show that the three altitudes from vertices A, B, and C of the triangle are concurrent (*i.e.* meet at a single point). *[10]*
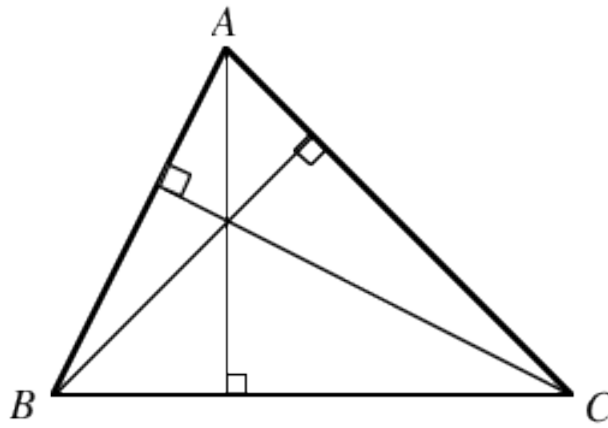
NOTE: The points at which the altitudes meet the opposite sides are the *feet* of the altitudes. The point at which the three altitudes meet is the triangle's *orthocentre*.

Sonnet xlv

Euclid alone has looked on Beauty bare.
Let all who prate of Beauty hold their peace,
And lay them prone upon the earth and cease
To ponder on themselves, the while they stare
At nothing, intricately drawn nowhere
In shapes of shifting lineage; let geese
Gabble and hiss, but heroes seek release
From dusty bondage into luminious air.
O blinding hour, O holy, terrible day,
When first the shaft into his vision shone
Of light anatomized! Euclid alone
Has looked on Beauty bare. Fortunate they
Who, though once only and then but far away,
Have heard her massive sandal set on stone.

Edna St. Vincent Millay

Lobachevsky alone has looked on Beauty bare.
She curves in here, she curves in here. She curves out there.
Her parallel clefts come together to tease
In un-callipygianous-wise;
With fewer than one hundred eighty degrees
Her glorious triangle lies.
Her double-trumpet symmetry Riemann did not court –
His tastes to simpler-curvedness, the buxom Teuton sort!
An ellipse is fine for as far as it goes,
But modesty, away!
If I'm going to see Beauty without her clothes
Give me hyperbolas any old day.

The world is curves, I've heard it said,
And straightway in it nothing lies.
This then my wish, before I'm dead:
To look through Lobachevsky's eyes.

From the novel *Doorways in the Sand* by Roger Zelazny.