Mathematics 226H – Geometry I: Euclidean geometry
TRENT UNIVERSITY, Winter 2008

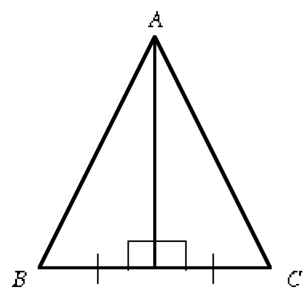
Quizzes

Quiz #1. Friday, 18 January, 2008. *[10 minutes]*

1. Given a line segment AB, show, using Euclid's system, that there is a point C so that B is on AC and $|BC| = |AB|$. *[5]*

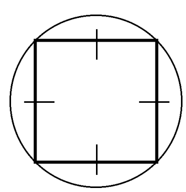
Quiz #2. Friday, 25 January, 2008. *[10 minutes]*

1. Suppose that the median from A in $\triangle ABC$ is also an altitude. Show that $\triangle ABC$ is isosceles. *[5]*



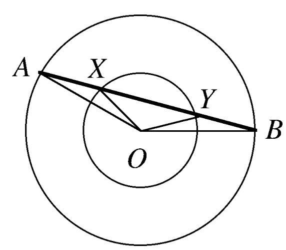
Quiz #3. Friday, 1 February, 2008. *[10 minutes]*

1. Show that a rhombus inscribed in a circle must be a square. *[5]*



Quiz #3. *Alternate version. [10 minutes]*

1. A line is drawn through two concentric circles as shown.



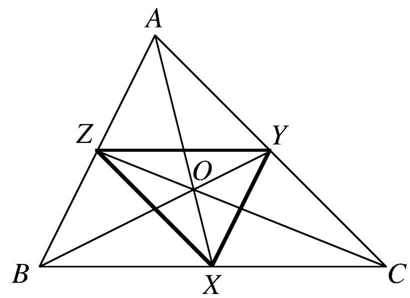
Show that $\triangle OXA \cong \triangle OYB$. *[5]*

Quiz #4. Friday, 8 February, 2008. *[10 minutes]*

1. Suppose $\triangle ABC$ and $\triangle PQR$ have $\angle A = \angle P = 90°$ and $\frac{|AB|}{|PQ|} = \frac{|BC|}{|QR|}$. Show that $\angle B = \angle Q$. *[5]*

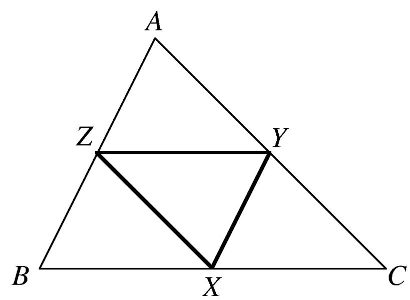
Quiz #5. Friday, 15 February, 2008. *[10 minutes]*

1. The medians AX, BY, and CZ meet in the centroid O of $\triangle ABC$. Show that O is also the centroid of $\triangle XYZ$. *[5]*



Quiz #6. Friday, 7 March, 2008. *[10 minutes]*

1. Suppose X, Y, and Z are the midpoints of sides BC, AC, and AB, respectively, of $\triangle ABC$. Show that the circumcentre of $\triangle ABC$ is also the orthocentre of $\triangle XYZ$. *[5]*



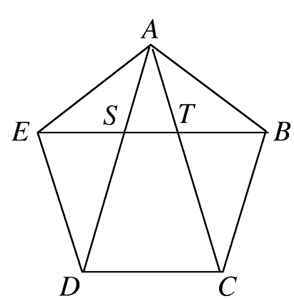
Quiz #7. Friday, 14 March, 2008. *[10 minutes]*

1. Suppose $\triangle ABC$ has $\angle C = 90°$ and sides $a = 3$, $b = 4$, and $c = 5$. Find the inradius r of $\triangle ABC$. *[5]*

Hint: Depending on how you proceed, you may find the trigonometric identity $\tan\left(\frac{\theta}{2}\right) = \frac{\sin(\theta)}{1+\cos(\theta)}$ to be useful.

Quiz #8. Thursday, 20 March, 2008. *[10 minutes]*

1. Suppose $ABCDE$ is a regular pentagon, S is the intersection of AD and BE, and T is the intersection of AC and BD. Compute $\mathbf{cr}(E, S, T, B)$. *[5]*



Hint: The following values of $\sin(\theta)$ may be of use:

θ	$0°$	$36°$	$72°$	$108°$
$\sin(\theta)$	0	0.59	0.95	0.95

Quiz #9. Friday, 28 March, 2008. *[10 minutes]*

1. Suppose $\triangle ABC$ is a right triangle with $\angle B = 90°$, $a = 4$, $b = 5$, and $c = 3$. Z isa point on side AB such that $|AZ| = 2$, and X is a point on side BC such that $|BX| = 1$. Find the point Y on side AC such that AX, BY, and CZ are concurrent. *[5]*