Mathematics 2260H – Geometry I: Euclidean geometry
TRENT UNIVERSITY, Winter 2012

Quizzes

Quiz #1. Tuesday, 17 January, 2012. *[10 minutes]*

1. Given a line segment AB, use (some of) Postulates I–V, A, and S to show there exists a line segment that is exactly three times the length of AB. *[5]*

Quiz #2. Tuesday, 24 January, 2012. *[10 minutes]*

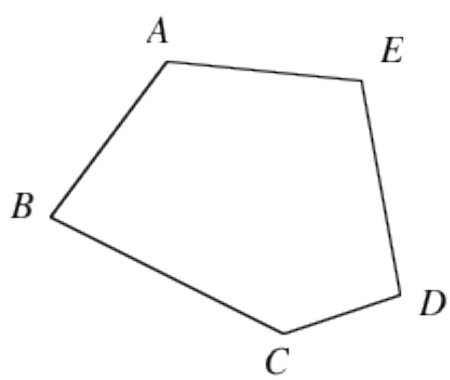
1. Suppose D is the midpoint of side BC (*i.e.* $BD = CD$) of $\triangle ABC$ and $AB = AC$. Show that $\angle ADB$ is a right angle. *[5]*

Quiz #3. Tuesday, 31 January, 2012. *[10 minutes]*

1. Suppose $\angle ABC$ of $\triangle ABC$ is a right angle. Show that $\angle ACB$ is *not* a right angle. (Without using Postulate V or any equivalent of it ...) *[5]*

Quiz #4. Tuesday, 7 February, 2012. *[10 minutes]*

1. Suppose $ABCDE$ is a (convex) pentagon, as in the diagram below.



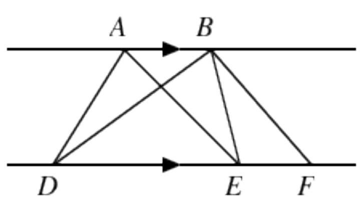
Show that the sum of the interior angles of $ABCDE$ is equal to six right angles. *[5]*

Quiz #5. Tuesday, 14 February, 2012. *[10 minutes]*

1. Suppose $ABCD$ is a convex quadrilateral such that $\triangle ABC \cong \triangle CDA$. Show that $ABCD$ is a parallelogram.

Quiz #6. Tuesday, 28 February, 2012. *[10 minutes]*

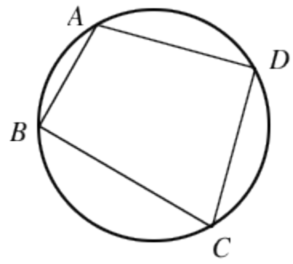
1. Suppose $AB \parallel DF$ and E is on DF between D and F.



Show that $\text{area}(\triangle ADE) + \text{area}(\triangle BEF) = \text{area}(\triangle BDF)$. *[5]*

Quiz #7. Tuesday, 6 March, 2012. *[10 minutes]*

1. Suppose $ABCD$ is a convex quadrilateral inscribed in a circle.



Show that $\angle ABC + \angle CDA = 2$ right angles. *[5]*

Quiz #8. Tuesday, 13 March, 2012. *[10 minutes]*

1. Suppose the centroid and orthocentre of $\triangle ABC$ are the same point. Show that $\triangle ABC$ is equilateral.

NOTE: Recall that the centroid of a triangle is the point where the three medians – the lines joining each vertex to the midpoint of the opposite site – meet, and that the orthocentre is the point where the three altitudes of the triangle meet.

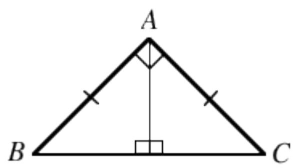
Quiz #9. Tuesday, 20 March, 2012. *[10 minutes]*

1. Suppose the incentre of $\triangle ABC$ is on the altitude from A. Show that $\triangle ABC$ is isosceles.

NOTE: Recall that the incentre is the point where the three angle-bisectors of the triangle meet.

Quiz #10. Tuesday, 27 March, 2012. *[10 minutes]*

1. Suppose $\triangle ABC$ is an isosceles triangle with $\angle BAC$ a right angle.



Show that the Euler line of $\triangle ABC$ is the altitude from A. *[5]*