Mathematics 2260H – Geometry I: Euclidean geometry

Trent University, Fall 2015

Quizzes

Quiz #1. *Monday, 21 September, 2015. [10 minutes]*

1. Given an equilateral triangle $\triangle ABC$, use whichever you wish of Postulates I-V, S, and A, as well as Propositions I-1 through I-4, to show that there is an equilateral triangle $\triangle DEF$ whose sides are twice as long as the sides of $\triangle ABC$. *[5]*

Quiz #2. ~~*Monday, 28 September*~~ *Thursday, 1 October, 2015. [10 minutes]*

1. Suppose $\triangle ABC$ is isosceles with $|AB| = |AC|$, and D is a point on BC between B and C such that $\angle BAD = \angle CAD$. Show that $|BD| = |CD|$. *[5]*

Quiz #3. *Monday, 5 October, 2015. [15 minutes]*

1. Suppose A, B, C, and D are four points such that $|AB| = |CD|$ and $\angle ABC = \angle DCB$ are right angles. Show that $\triangle BAD \cong \triangle CDA$. *[5]*

Quiz #4. *Thursday, 15 October, 2015. [10 minutes]*

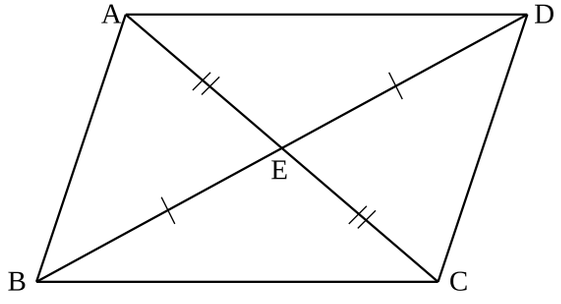
1. Show that the sum of the interior angles of any triangle is less than three right angles. *[5]*

Quiz #5. *Monday, 19 October, 2015. [15 minutes]*

1. Suppose $\triangle ABC$ is isosceles, with $|AB| = |AC|$, and D is a point on BC between B and C. Show that $|AD| < |AB|$. *[5]*

Quiz #6. ~~*Monday, 2*~~ *Thursday, 5 November, 2015. [10 minutes]*

1. Suppose $ABCD$ is a quadrilateral, E is the point where its diagonals, AC and BD intersect, and $|AE| = |CE|$ and $|BE| = |DE|$, as in the diagram below. Show that $ABCD$ is a parallelogram, *i.e.* that $AD \parallel BC$ and $AB \parallel DC$. *[5]*



Quiz #7. *Monday, 9 November, 2015. [10 minutes]*

1. Suppose $ABCD$ is a parallelogram, with $AB \parallel DC$ and $AD \parallel BC$. Show that $\triangle ABC$ has the same area as $\triangle DBC$. *[5]*

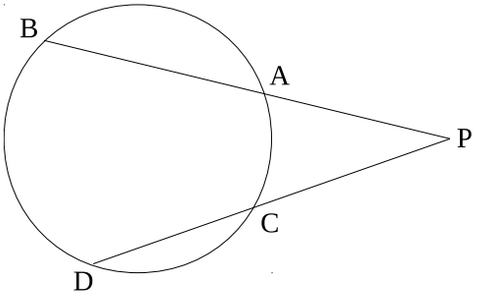
Quiz #8. *Monday, 16 November, 2015. [10 minutes]*

Do *one* (1) of the following problems:

1. Suppose $ABCD$ is a square with area 1. Use it to construct a square of area 2. *[5]*
2. Suppose a circle with centre C has radius 2, and A and B are points on the circle such that $|CD| = 1$ for the midpoint D of the chord AB. Find the area of $\triangle ABC$. *[5]*

Quiz #9. *Monday, 23 November, 2015. [10 minutes]*

1. Show that if AB and CD are chords of a circle that, when extended past A and C respectively, meet at a point P outside the circle, then $|PA| \cdot |PB| = |PC| \cdot |PD|$. *[5]*



Quiz #10. *Monday, 30 November, 2015. [10 minutes]*

1. Suppose the circumcentre C and the centroid G of $\triangle XYZ$ are the same point. Show that $\triangle XYZ$ is equilateral. *[5]*

Quiz #11. *Monday, 7 December, 2015. [10 minutes]*

1. Suppose the Euler line of $\triangle XYZ$ is also the triangle's altitude from X. Show that $\angle XYZ = \angle ZXY$. *[5]*