

## Mathematics-Science 380 – History of Mathematics

TRENT UNIVERSITY 2004-2005

### Assignment #7

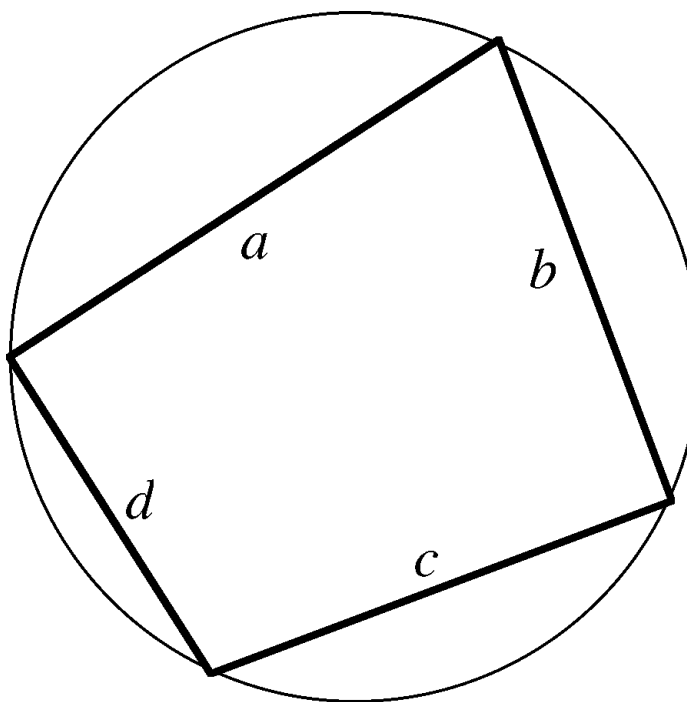
*Due on Monday, 31 January, 2005.*

1. Describe the Antikythera mechanism and its significance for our knowledge of the history of mathematics and related areas. [10]

A quadrilateral which can be inscribed in a circle is said to be *cyclic*. The Indian mathematician Brahmagupta discovered the following relative of Heron's formula, although he apparently did not trouble to prove it.

- Suppose a cyclic quadrilateral has sides of lengths  $a$ ,  $b$ ,  $c$ , and  $d$ , respectively, and let  $s = (a + b + c + d)/2$ . Then the area of the quadrilateral is given by:

$$A = \sqrt{(s - a)(s - b)(s - c)(s - d)}$$



2. Prove Brahmagupta's formula for the area of a cyclic quadrilateral. [10]