

MAT 360: MIDTERM

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| Name: (please print) | ID #: |
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| | 1 | 2 | 3 | 4 | Total |
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| <i>Grade</i> | | | | | |

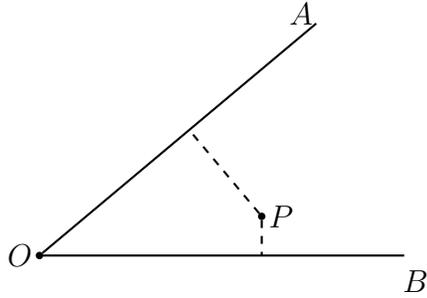
Open book: you are allowed to use the textbook and your notes.

Please remember that you are only allowed to use notions and results we had proved in class. “Construct” means “construct using a straightedge and compass”.

1. Given an angle $\angle AOB$, describe the geometric locus of all the points P inside $\angle AOB$ which satisfy the following condition:

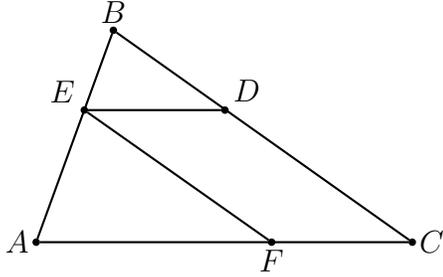
$$d(P, OA) - d(P, OB) = 1 \text{ cm}$$

where $d(P, OA)$ is the distance from P to the line OA , and $d(P, OB)$ is the distance from P to the line OB .

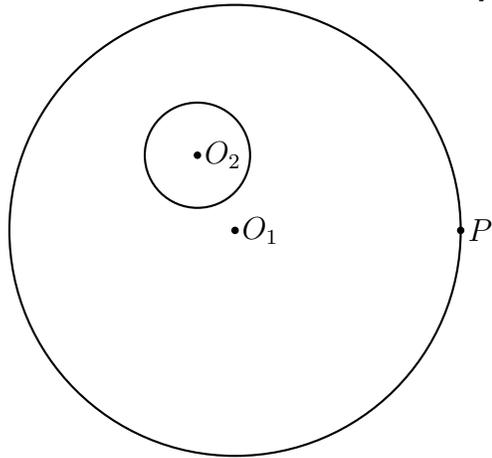


2. On the sides of triangle ABC , points D, E, F are chosen so that
- AD is the bisector of $\angle A$
 - $CDEF$ is a parallelogram

Prove that then, $AE \cong FC$.



3. Given two circles C_1, C_2 so that C_2 is inside C_1 , and a point P on the circle C_1 , construct a circle which is tangent to C_1 at point P and tangent to C_2 . [You are only required to construct one such circle.]



4. Given a segment AB and a point M on this segment, construct a point P such that $\angle APB = 30^\circ$ and PM is the bisector of angle $\angle P$.