

MATHEMATICS 3220. Homework # 5.

1. Find interior, closure and the boundary of the following sets. Sketch E . Give a proof that what you found are indeed interior, closure and the boundary.

a) $E = \{(x, y) : x^2 + 4y^2 - 2x - 2y \leq 0\}$.

b) $E = \{(x, y) : xy \neq 0, xy \neq 1\}$.

2. Prove that the following set is open:

$$E = \{(x, y, z) : x^3 + y^7 - xzy + \sin(x + y + z) < 0, e^{xy} < 7\}.$$

§9.2, # 1 (a,b,d), # 2. Note: Use theorem 9.24 instead of the definition of compact set.