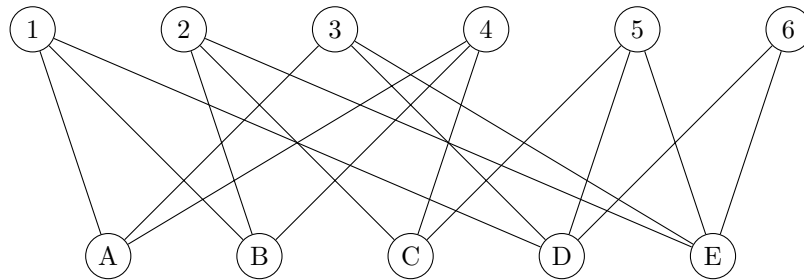


## MAS341 Graph Theory: Homework 2



All questions use the graph  $\Gamma$  shown above.

1. Show that  $\Gamma$  isn't Hamiltonian, using the fact that it's bipartite
2. Find a closed walk that uses every vertex but vertex 4 exactly once, and by adapting the Planarity Algorithm for Hamiltonian graphs, prove that  $\Gamma$  isn't planar (the argument begins: if it were drawn on the plane, the closed walk you found would be a circle. Now, vertex 4 must be inside or outside the circle... )
3. Give another proof that  $\Gamma$  isn't planar using Kuratowski's theorem
4. Let  $e$  be the edge connecting vertices D and 5. Show that if we remove  $e$ , the resulting graph  $\Gamma \setminus e$  is planar by drawing it on the plane, being sure to label your vertices.