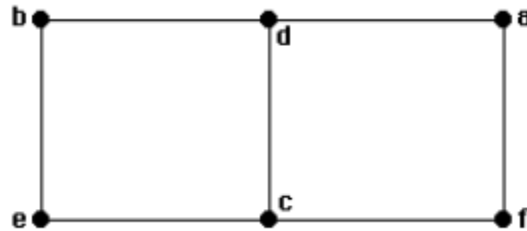


Tutorial Sheet – 10 Solutions

1. This graph has no Euler circuit, since the degree of vertex b (for one) is odd. There is an Euler path between the two vertices of odd degree. One such path is b, c, d, e, f, d, g, i, d, a, h, i, a, b, i, c.
2. This graph has no Hamilton circuit. No Hamilton path exists.
3. No, A still has odd degree.
4. Length: 16, Path: *a, c, d, e, g, z*
5. **a)** Via Woodbridge, via Woodbridge and Camden **b)** ViaWoodbridge, viaWoodbridge and Camden
6. This graph is easily untangled and drawn in the following planar representation.



7. Euler's formula says that $v - e + r = 2$. We are given $v = 8$, and from the fact that the sum of the degrees equals twice the number of edges, we deduce that $e = (3 \cdot 8)/2 = 12$. Therefore $r = 2 - v + e = 2 - 8 + 12 = 6$.
8. We draw the graph in which two vertices (representing locations) are adjacent if the locations are within 150 miles of each other.



Clearly three colors are necessary and sufficient to color this graph, say red for vertices 4, 2, and 6; blue for 3 and 5; and yellow for 1. Thus three channels are necessary and sufficient.