Section 1.1.2

1 Graph G of order n with maximal number of edges if the complete graph K_n, which has $\binom{n}{2} = \frac{n(n-1)}{2}$ edges.

2 To show a contradiction, suppose otherwise. We know there are an even number of odd degree vertices, implying that there can be no odd degree vertices. But the max degree of a graph is n-1 (connected to every other vertex), so the degree is between 0 and n-1. Excluding the odd degrees, there are not enough unique numbers to cover all the vertices.

3 For later.

4 If no such path exists, the two odd vertics are on separate connected components A and B. Consider A by itself, it is a connected graph, but it has an odd number of vertices with an odd degree, a contradiction .

5 a)

b)

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13 a)

b)

c)

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