MTH 4320 Homework 3

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Problem 1

Solution. Let the graph on the left be G and the graph of the drawing be H. Notice that the set of vertices $\{a, c, f, g, h\}$ in G is an independent set where no two vertices in the set are adjacent. We can label the vertices in H as $\{a, c, f, h\}$ on the left side and $\{g, e, d, b\}$ on the right side from top to bottom respectively. Then we have the vertex a is adjacent to the vertices $\{b, d, e\}$ denoted by $a \sim \{b, d, e\}$. Similarly, we have $c \sim \{b, d, g\}$, $f \sim \{b, e, g\}$, and $h \sim \{d, e, g\}$. Hence we have that any two vertices with the same labels are adjacent in G if and only if they are adjacent in H. Therefore, it is shown that G and H are identical or $G \cong H$, G is isomorphic to H. ■

Problem 2

Problem 3