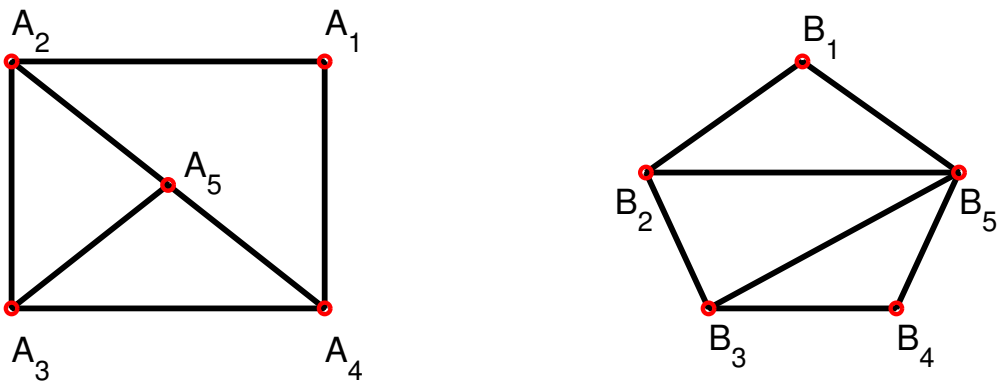
Quiz #16

SOLUTIONS

1. { 10 points } **Determine whether the given pair of graphs is isomorphic. Exhibit an isomorphism or provide a rigorous argument that none exists.**



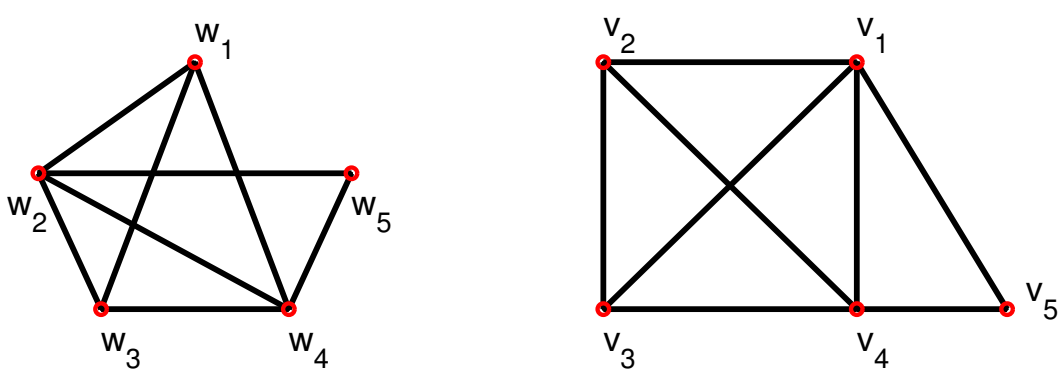
(a)

The degrees of the vertices of the graphs are:

$$\deg(A_1) = 2, \quad \deg(A_2) = 3, \quad \deg(A_3) = 3, \quad \deg(A_4) = 3, \quad \deg(A_5) = 3$$

$$\deg(B_1) = 2, \quad \deg(B_2) = 3, \quad \deg(B_3) = 3, \quad \deg(B_4) = 2, \quad \deg(B_5) = 4$$

Since the second graph has vertex of degree 4 and there is no such vertex in the first graph, the graphs are not isomorphic.



(b)

The graphs are isomorphic. One isomorphism is the following:

$$f(w_1) = v_2, \quad f(w_2) = v_1, \quad f(w_3) = v_3, \quad f(w_4) = v_4, \quad f(w_5) = v_5.$$