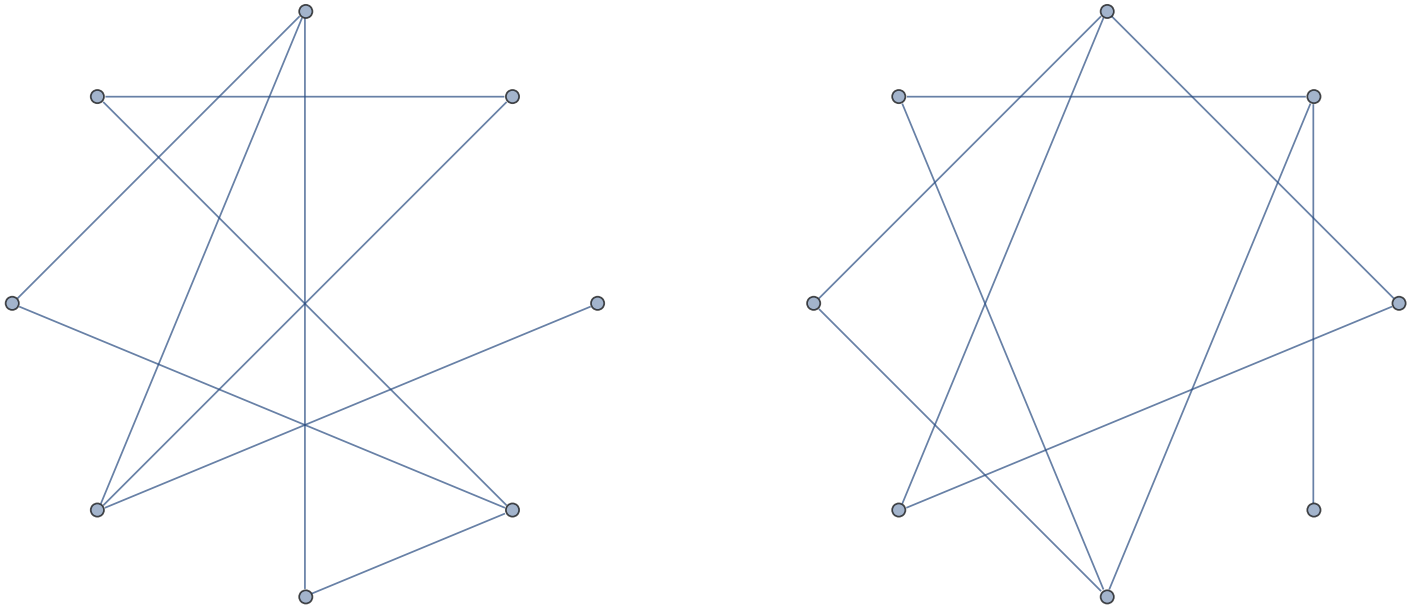
Isomorphism

Prove that the two graphs below are not isomorphic.



Hint: it may prove helpful to label the vertices, write out the adjacency lists and then redraw the graphs.

These slides are available on Blackboard and at `https://bit.ly/3qlhic1`

In a particularly friendly section of Manchester's Northern Quarter, the neighbours are trying to choose channels for their WiFi routers in such a way that they don't interfere with each other. If we label their flats with letters **A**–**G** then the distances (in meters) between them are given by the table below.

	A	**B**	**C**	**D**	**E**	**F**
B	85					
C	137	165				
D	123	39	205			
E	164	132	117	171		
F	105	75	235	92	201	
G	134	191	252	223	298	177

If good wireless reception requires that neighbours within 150 meters of each other should use different channels, what is the smallest number of channels that the neighbours can use?

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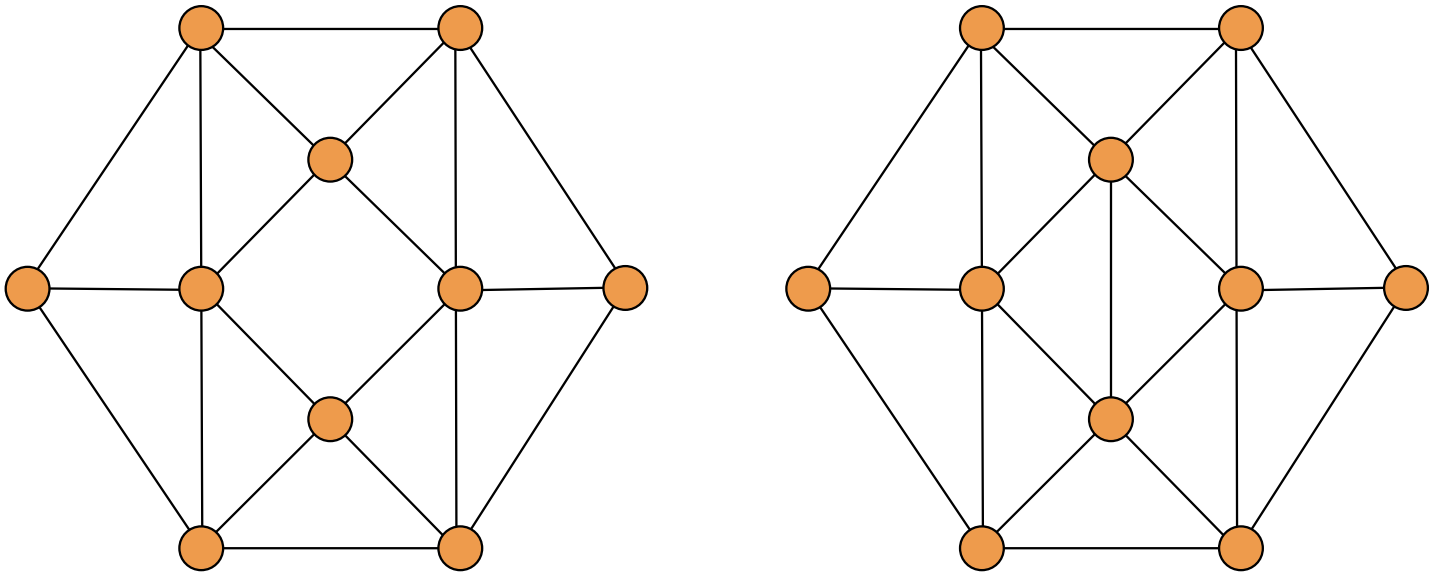

Find the chromatic numbers of the graphs above. The one at right is the *Birkhoff Diamond*, named after the american mathematician George David Birkhoff, who constructed it while working on the famous Four Colour Theorem.

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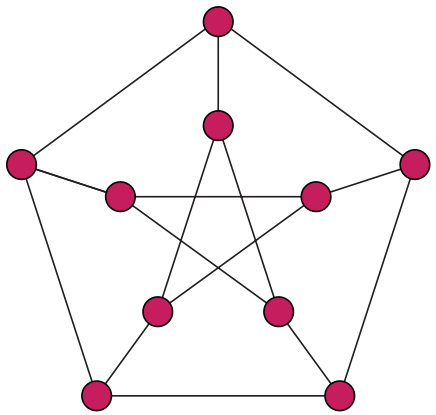
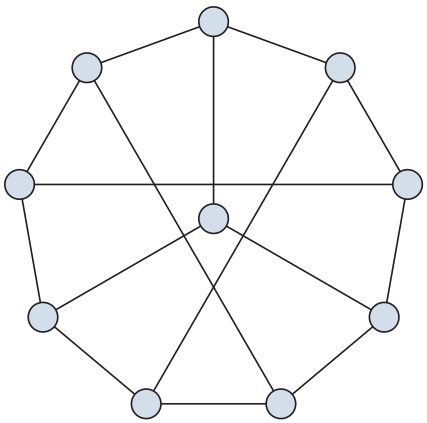
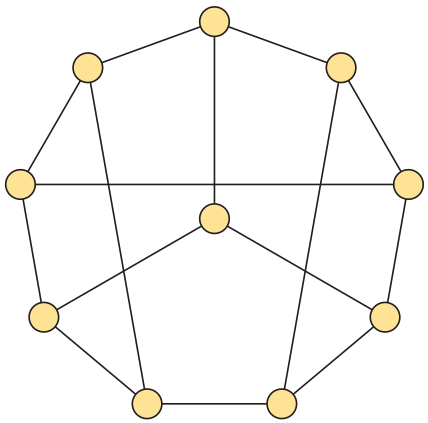


P



Q



R

Two of the graphs above are isomorphic.

(i) For the pair that is isomorphic, give an appropriate bijection between vertex sets.

(ii) Prove that the remaining graph is not isomorphic to the other two.

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