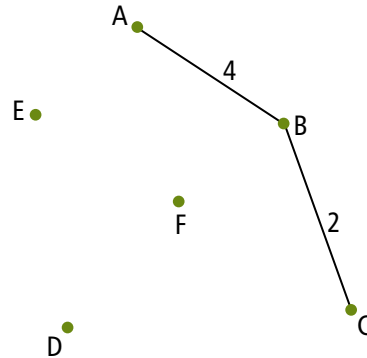
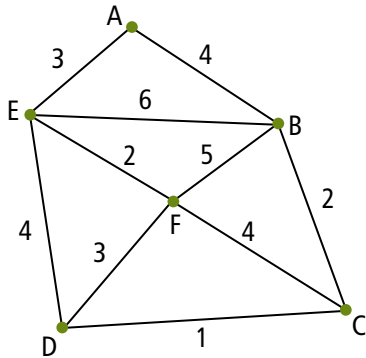


Achievement Standard 91260 (Mathematics and Statistics 2.5)

Apply network methods in solving problems

Practice assessment

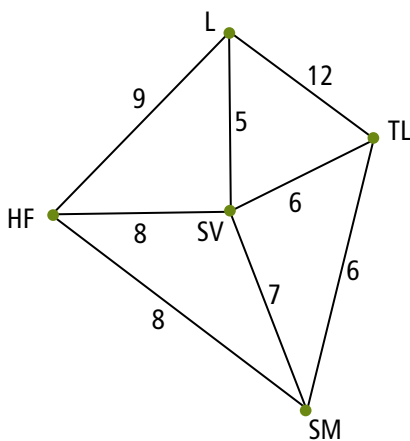
1. A weighted network is drawn below. Complete the partly drawn spanning tree so that it has a weight of 14 units.



2. Walking tracks in National parks are designed so that they have a minimum total length. In the Lake District the favourite places trampers visit are High Falls (HF), Lookout (L), The Lakes (TL), Snow Mountain (SM), and Surprise View (SV). The distances in kilometres, between each of these places, is shown on the network.

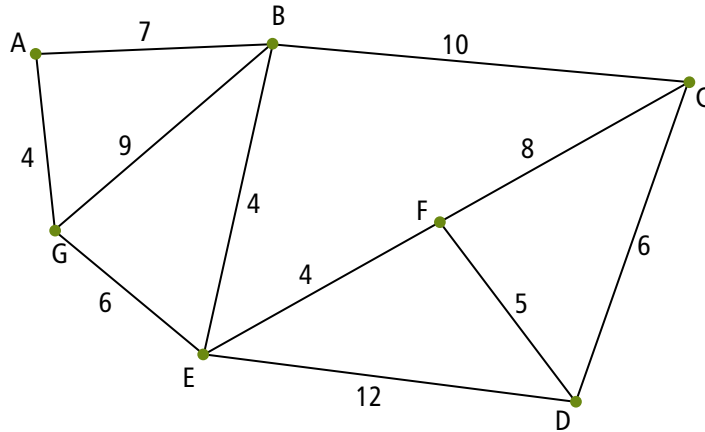


What is the minimum length of mountain track required to join all five favourite places?
Make a network sketch of your answer.



Minimum length of track is _____ km

3. Yvette is a travelling salesperson and she sells perfume to beauty shops in seven towns in her district. The network below shows the towns labelled A, B, C, D, E, F, G and the distances between the towns in kilometres.



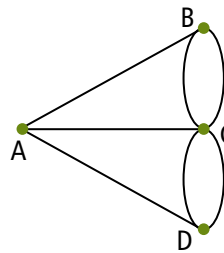
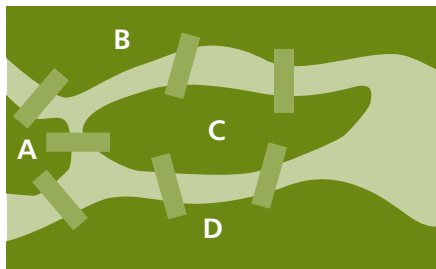
Yvette lives in town A and her manager tells her to visit town D urgently to revise her perfume order. Yvette wants her route from A to D to be the shortest possible distance.

- a. List the order of the towns Yvette will need to pass through to arrive at D by the shortest route.

 - b. What distance in kilometres is this shortest route from A to D?

4. Königsberg Bridge problem – revisited

The town of Königsberg was near the river Pregel, which divided and flowed around an island. There were seven bridges over the river as shown in the figure (land is drawn shaded). A network modelling the situation is drawn alongside.



The problem was to start at some point, say A, and walk over every bridge only once and return to your starting point, without getting your feet wet!

- a. Give the order of each node in the network and explain why it is not possible to walk over every bridge only once and return to your starting point, without getting your feet wet.

Node	A	B	C	D
Order				

- b. The mayor of Königsberg suggested building another bridge from C to D, to make this problem possible.
 - i. Show this extra bridge on the network drawn above. List the order of each node in this new network.

Node	A	B	C	D
Order				

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- ii. Is the mayor correct in saying that you can now start and end at A and cover each edge of the network only once?

- iii. Demonstrate that the new network is traversable by listing points in a pathway which covers each edge of the network only once.
