1. We start from $A$ and draw the tree formed by the edges we can reach from $A$. The nodes are labelled with the distance from $A$.
(3)
2. The next step is to extend the trees to all the nodes we can reach from $B, C$, and $D$, and label them with the distances from $A$.

- From B: $F(4+4=8)$ and $D(4+1=5)$
- From $\mathrm{D}: \mathrm{G}(7+7=14)$ and $\mathrm{E}(7+2=$ 9)
- From $\mathrm{C}: \mathrm{D}(3+3=6)$ and $\mathrm{E}(3+5=9)$

3. In this new column of nodes, $D$ and $E$ appear twice.

- We only need the one with the shortest distance from $A$, so we delete $\mathrm{D}(6)$ and $\mathrm{E}(9)$. (You could just cross them out rather than deleting them.)


4. Next extend the tree from F, D, and E in the same way. $G$ is the finishing point so that branch is not extended.

|  |
| :---: |
|  |

The shortest distance from A to G is 9, and the path is ABDEG.
Students should be encouraged to draw the trees step by step to clearly
communicate their thinking.

New Zealand curriculum guides senior secondary: Mathematics and statistics
© Ministry of Education 2011 - copying restricted to use in the New Zealand education sector 27/3/12

