

Find the shortest paths, and their lengths, from vertex v_1 to each of the other vertices in the graph shown below. (*Weights appear off the centre point of corresponding edge.*)

| | v_1 | v_2 | v_3 | v_4 | v_5 |
|-------|-------|-------|-------|-------|-------|
| v_1 | 0 | 16 | 0 | 8 | 12 |
| v_2 | 16 | 0 | 0 | 6 | 3 |
| v_3 | 0 | 0 | 0 | 0 | 4 |
| v_4 | 8 | 6 | 0 | 0 | 1 |
| v_5 | 12 | 3 | 4 | 1 | 0 |

