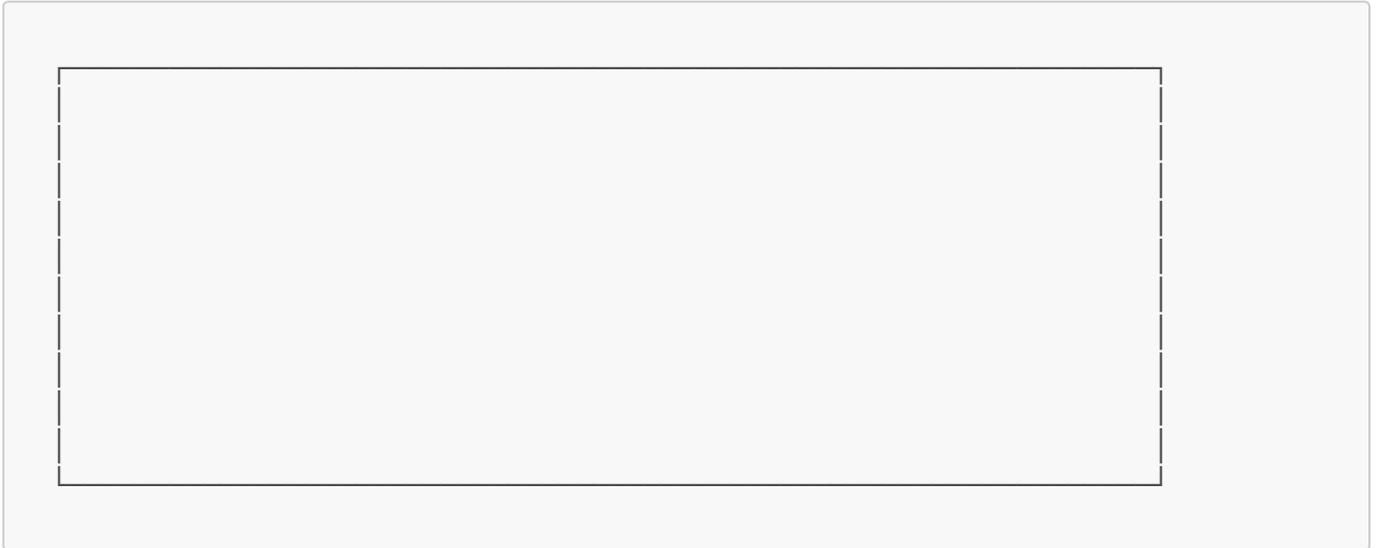


Route Finder — Shortest Path Worksheet

Name: _____ Date: _____

Part 1: Draw the Graph

In the box below, draw the island as a graph: circles (nodes) for towns, lines (edges) for roads. Write the distance on each edge.



Part 2: Intuitive Routes

Without calculating, what route from Alpha to Kappa End looks shortest?

Route: $\alpha \rightarrow _ \rightarrow _ \rightarrow _ \rightarrow _ \rightarrow \kappa$

Estimated distance: $_ \text{ km}$

Part 3: Systematic Shortest Path

Process: Start at Alpha (distance=0). Look at all connected towns. Note their distances. Visit the closest unvisited town. Update distances to its neighbours if you found a shorter route.

Town	Shortest distance found so far	Via this route
Alpha (α)	0	(start)
Betaville (β)		
Gammaford (γ)		
Delta Bay (δ)		
Epsilon (ϵ)		

Town	Shortest distance found so far	Via this route
Zeta Heights (ζ)		
Etaville (η)		
Theta Cross (θ)		
Iota (ι)		
Kappa End (κ)		

Part 4: Shortest Paths from Alpha

Destination	Shortest distance	Route
Betaville		
Gammaford		
Delta Bay		
Epsilon		
Zeta Heights		
Etaville		
Theta Cross		
Iota		
Kappa End		

Part 5: Delivery Challenge

Visit: Epsilon, Etaville, Iota, Kappa End — then return to Alpha.

Route attempt 1: α → ___ → ___ → ___ → ___ → α

Total distance: ___ km

Route attempt 2 (different order): α → ___ → ___ → ___ → ___ → α

Total distance: ___ km

Best route found: ___ km

Was the intuitive "nearest neighbour" approach (always go to the closest unvisited town) optimal?

Part 6: Reflection

What is the difference between "shortest path between two points" and "shortest tour visiting multiple points"?

How does Google Maps find your route so quickly, even for very large road networks?
