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Part 4: Utility

Rocky: 30min/km
Sandy: 20min/km
Smooth: 12min/km

Part 1:
Route 1: 0.2*20*5 + 0.3*12*5 + 0.5*30*5 = 113 mins
Route 2: 0.4*20*7 + 0.2*12*7 + 0.4*30*7 = 156.8 mins
Route 3: 0.5*20*6 + 0.4*12*6 + 0.1*30*6 = 106.8 mins

Route 3 is the best

Part 2:
Route 1: 113 - 0.7*20 + 0.3*15 = 103.5 mins
Route 3: 106.8 + 0.6*40 = 130.8 mins

Route 1 is the best

Part 3:
Route 2: 156.8 - 0.4*30*7 = 72.8 mins

Part 4:
0.6

Part 5:
If Route 2 is rocky: 30*7 = 210 mins
We should take Route 1, which takes 103.5 mins

Part 6
There is a 0.6 probability that the satellite will tell us that Route 2 is rocky, which would have us choosing Route 1:
0.6*103.5 = 62.1 mins of utility
0.4 probability that the satellite will tell us that Route 2 is not rocky, which would have us choosing Route 2:
0.4*72.8 = 29.12 mins of utility
103.5 - 72.8 = 30.7 mins
We should wait 29.12 mins for the satellite