Part 4

① rocky = 2 km/h = 30 min/km
sandy = 3 km/h = 20 min/km
smooth = 5 km/h = 12 min/km

Route 1 = (0.2 × 20) + (0.3 × 12) + (0.5 × 30)
= 4 + 3.6 + 15 = 22.6 × 5 = 113 min
Route 2 = (0.4 × 20) + (0.2 × 12) + (0.4 × 30)
= 8 + 2.4 + 12 = 22.4 × 7 = 156.8 min
Route 3 = (0.5 × 20) + (0.4 × 12) + (0.1 × 30)
= 10 + 4.8 + 3 = 17.8 × 6 = 106.8 min
route 3 is fastest

② Route 1 = 113 - (20 × 0.7) + (15 × 0.3)
113 - 14 + 4.5 = 103.5 min
Route 2 = 156.8 min
Route 3 = 106.8 + (0.6 × 40) + (0.4 × 0)
106.8 + 24 = 130.8 min
route 1 is fastest with these new
deviations

2/3   1/3
③ Route 2 not rocky, sandy = 0.4, smooth = 0.2
= (0.667 × 20) + (0.333 × 12) =
13.34 + 3.996 = 17.336 × 7 = 121.352 min

④ rocky = 40%, 60% not rocky
60% chance the satellite will tell us
its not rocky

⑤ if the satellite tells us it is rocky
we can use route 1 instead because
even if the satellite is wrong, route
1 is faster (including the new estimates)

⑥ Route 2, rocky = 30 × 7 = 210 min

not rocky = 121.352 min

Route 1 = 103.5 min

wait 17 min (with crater)

wait 14 min (w/o crater)