ASSIGNMENT #5 - Q1

PART 1

$T = \sum_i (P \times D/S_i)$

a] Rocky: $0.5 \cdot \left(\frac{2\ \cancel{km}}{2\ km/h}\right) = \boxed{0.5h}$

b] Sandy: $0.2 \cdot \left(\frac{2\ km}{3\ km/h}\right) = 0.2 \cdot {}^{2}/_{3}h = \boxed{\sim 0.13h}$

c] Smooth: $0.3 \cdot \left(\frac{2\ km}{5\ km/h}\right) = 0.3 \cdot {}^{2}/_{5}h = \boxed{0.12h}$

Route 1 = $0.5 + 0.13 + 0.12 = \boxed{0.75h}$

d] Rocky: $0.4 \cdot \left(\frac{1.8\ km}{2\ km/h}\right) = 0.4 \cdot 0.9h = \boxed{0.36h}$

e] Sandy: $0.4 \cdot \left(\frac{1.8\ km}{3\ km/h}\right) = 0.4 \cdot 0.6h = \boxed{0.24h}$

f] Smooth: $0.2 \cdot \left(\frac{1.8\ km}{5\ km/h}\right) = 0.2 \cdot 0.36 = \boxed{0.072h}$

Route 2 = $0.36 + 0.24 + 0.072 = \boxed{0.672h}$

g] Rocky: $0.1 \cdot \left(\frac{3.1\ km}{2\ km/h}\right) = \boxed{0.155h}$

h] Sandy: $0.5 \cdot \left(\frac{3.1\ km}{3\ km/h}\right) \sim \boxed{0.52h}$

i] Smooth: $0.4 \cdot \left(\frac{3.1\ km}{5\ km/h}\right) = \boxed{0.248h}$ →

Route 3: 0.155 + 0.517 + 0.248 = **0.92 h**

Route 2 < Route 1 < Route 3, so the Rover should use **Route 2**

PART 2

a] Route 1 = 0.75 h

Additional time = 0.3 · 0.75

0.75 + (0.3 · 0.75) = **0.975**

b] Route 2 = 0.672 + (0.6 · 1) = **1.272**

c] Route 3 ⇒ same = **0.92**

Route 3 < Route 1 < Route 2, so the Rover should use **Route 3**

PART 3

a] $T_{smooth} = \frac{3.1\ km}{5\ km/h} =$ **0.62 h**. This is the best case scenario (if confirmed by the satellite)

b] Route 3 = 0.92, so the difference is 0.92 - 0.62 = **0.3 h**

c] If the satellite can do this within 0.3 h, then it's helpful