Problem 1.

A space rocket with mass M=12t is moving around the Moon along the circular orbit at the height of h =100 km. The engine is activated for a short time to pass at the lunar landing orbit. The velocity of the ejected gases u = 10^4 m/s. The Moon radius R_M = 1,7·10^3 km, the acceleration of gravity near the Moon surface g_M = 1.7 m/s^2

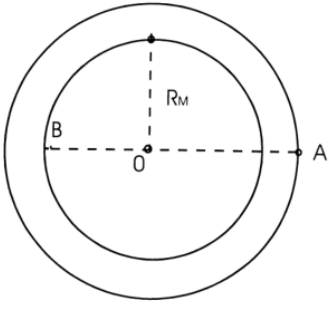


Fig.1

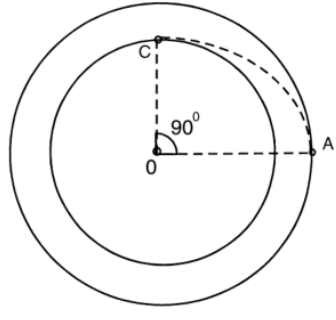


Fig.2

1). What amount of fuel should be spent so that when activating the braking engine at point A of the trajectory, the rocket would land on the Moon at point B (Fig.1)?

2). In the second scenario of landing, at point A the rocket is given an impulse directed towards the center of the Moon, to put the rocket to the orbit meeting the Moon surface at point C (Fig.2). What amount of fuel is needed in this case?