4 A rocket is midway between the Earth and Moon as shown in Fig. 4.1.

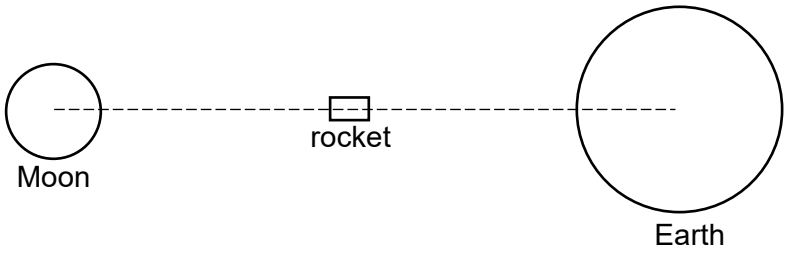

Fig. 4.1

The distance between the centers of mass of the Moon and Earth is 384×10^3 km. The mass of the Moon is 7.35×10^{22} kg and the mass of the Earth is 5.97×10^{24} kg.

(a) Calculate the escape velocity of the rocket when it is midway between the Earth and Moon.

escape speed = ... m s^{-1} [3]

(b) Explain qualitatively how the escape velocity of the rocket will change as its position is moved nearer the moon from its current position.

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…….. [3]

[Total: 6]