

For objects in elliptical orbits, the position farther from the gravity source is called the apogee and the position nearer is called the perigee. Compare the speed of a satellite at these two locations.

Farther (apogee) speed will be less and closer (perigee) speed will be more. It follows from conservation of energy or angular momentum.

1. as the orbiting object goes closer, potential energy decreases, hence kinetic energy should increase, so speed should be more and vice versa.
2. Angular momentum at apogee and perigee is mvr . r becoming less should be compensated by v becoming more in the same ratio and vice versa.