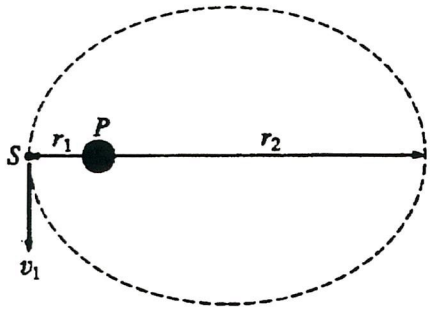


32. A satellite S is in an elliptical orbit around a planet P, as shown above, with r_1 and r_2 being its closest and farthest distances, respectively, from the center of the planet. If the satellite has a speed v_1 at its closest distance, what is its speed at its farthest distance?

(A) $\frac{r_1}{r_2} v_1$

(B) $\frac{r_2}{r_1} v_1$

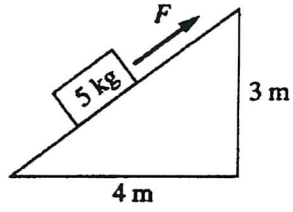
(C) $(r_2 - r_1) v_1$

(D) $\frac{r_1 + r_2}{2} v_1$

(E) $\frac{r_2 - r_1}{r_1 + r_2} v_1$

33. A simple pendulum consists of a 1.0-kilogram brass bob on a string about 1.0 meter long. It has a period of 2.0 seconds. The pendulum would have a period of 1.0 second if the

(A) string were replaced by one about 0.25 meter long
(B) string were replaced by one about 2.0 meters long
(C) bob were replaced by a 0.25-kg brass sphere
(D) bob were replaced by a 4.0-kg brass sphere
(E) amplitude of the motion were increased



34. A block of mass 5 kilograms lies on an inclined plane, as shown above. The horizontal and vertical supports for the plane have lengths of 4 meters and 3 meters, respectively. The coefficient of friction between the plane and the block is 0.3. The magnitude of the force F necessary to pull the block up the plane with constant speed is most nearly

(A) 30 N
(B) 42 N
(C) 49 N
(D) 50 N
(E) 58 N