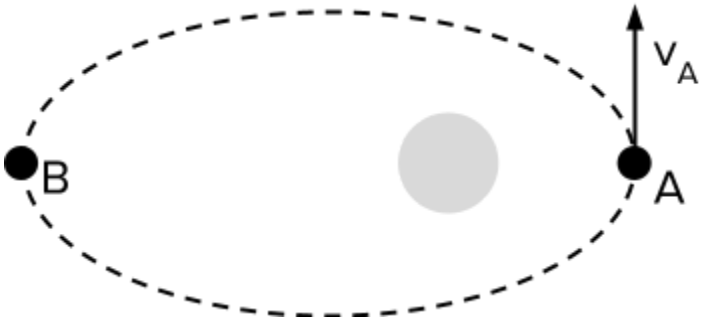
Universal gravitational potential energy



A planet of mass M moves in an elliptical orbit around a star as seen in the diagram above. At point A the planet is moving with speed v_A and is a distance r_A away from the center of the star. How fast is the planet moving when it is at point B, a distance r_B away from the star?

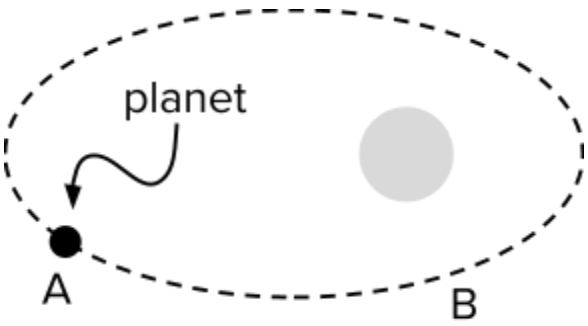
(A) $v_A(\frac{r_A}{r_B})$

(B) $v_A(\frac{r_B}{r_A})$

(C) $Mv_A(\frac{r_B}{r_A})$

(D) $Mv_A(\frac{r_A}{r_B})$

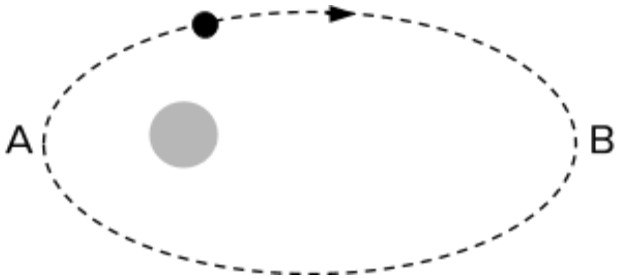
Answer:



A planet of mass M moves in an elliptical orbit around a star as seen in the diagram above. As the planet moves from point A to point B, what happens to the gravitational potential energy of the planet star system and the magnitude of the planet's angular momentum with respect to the star?

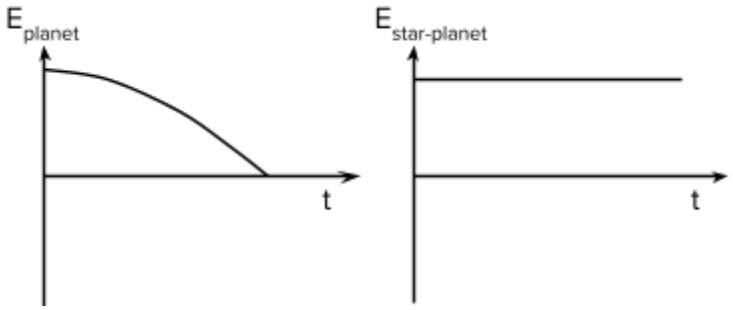
	Star-planet potential energy	**Planet's angular momentum**
(A)	Increases	Increases
(B)	Decreases	Remains constant
(C)	Remains constant	Increases
(D)	Decreases	Increases

Answer:

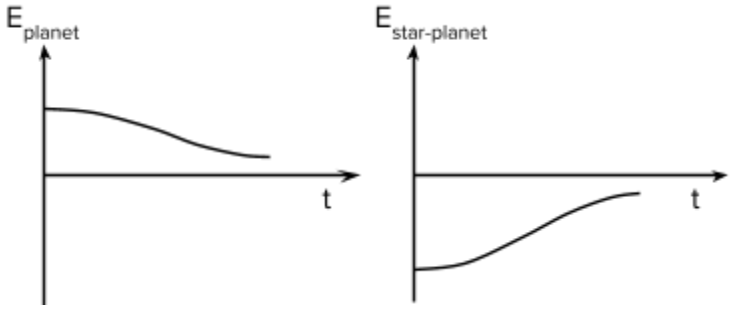


A planet is orbiting a star in an elliptical orbit as seen in the diagram above. Which of the following pairs of graphs best represents the mechanical energy of just the planet and the total mechanical energy of the star-planet system during the time it takes the planet to move from point A to point B?

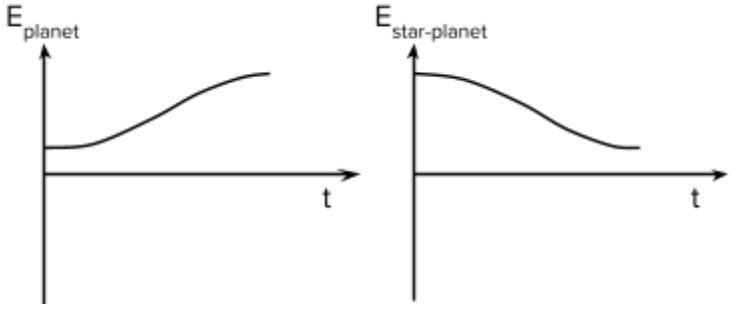
(A)



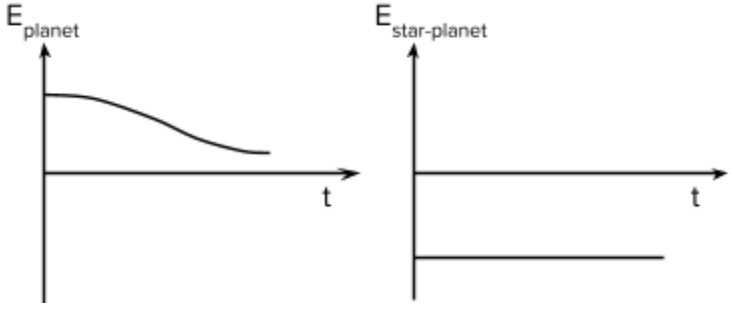
(B)



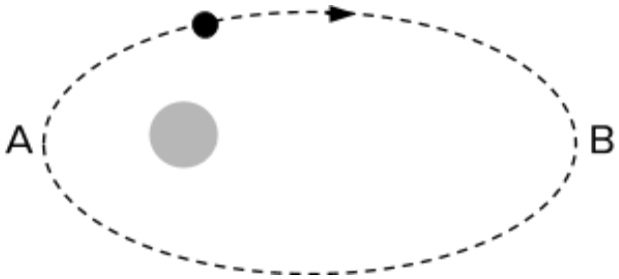
(C)



(D)

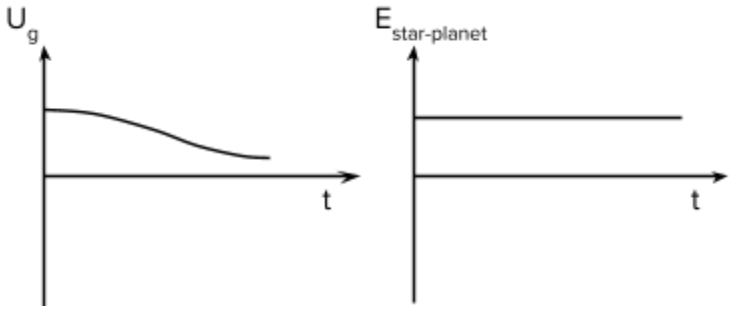


Ans:

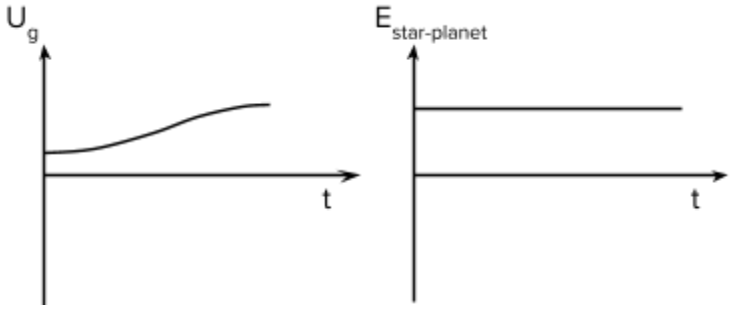


A planet is orbiting a star in an elliptical orbit as seen in the diagram above. Which of the following pairs of graphs best represents the gravitational potential energy U_g of the star-planet system and the total mechanical energy of the star-planet system during the time it takes the planet to move from point A to point B? (Assume the conventional zero point for gravitational potential energy)

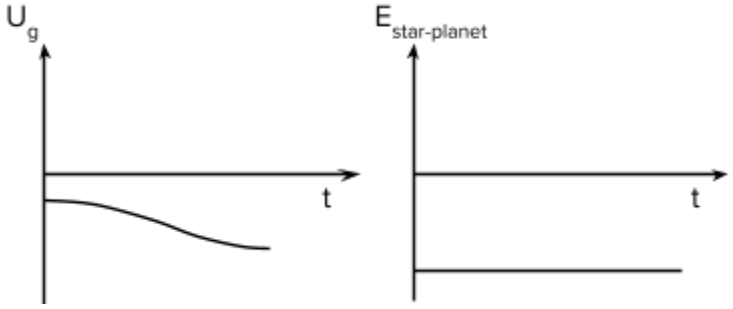
(A)



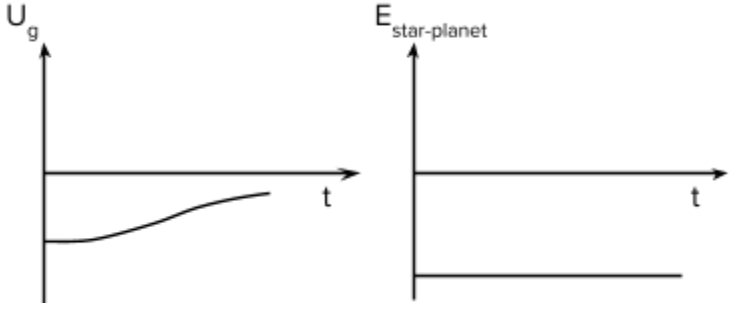
(B)



(C)



(D)



Ans: