Physics-Based Animation (SET09119)

Tutorial 06 - Energy, Work & Power

1   Question

Assuming the mass of $1m^3$ of water is $1000kg$. Find the work done in giving $1m^3$ of water a velocity of $8ms^{-1}$.

2   Question

Find the work done in raising a body of mass $50kg$ a distance of $8m$ into a space craft stationary on the surface of the moon. (Take the moon's gravity to be $1.65ms^{-2}$).

3   Question

A frog of mass $40kg$ slides down a slide inclined at 60^0 to the horizon. The frog starts from rest and there is a constant frictional resistance of $60N$. What velocity will the frog pass the point $10m$ from his starting point (2 decimal places)? (gravity is $9.8ms^{-2}$).

4   Question

A bullet of mass 10 grammes, velocity $600ms^{-1}$, enters $2.4m$ into the protective sandbags before coming to a rest. What is the resisting force of the sandbags (assumed constant)?

5   Question

A body of mass $20kg$ slides down a smooth plane inclined at 30^0 to the horizon. Initially it is at rest. What is the speed when it has travelled $5m$ down the plane? (gravity is $9.8ms^{-2}$).

6   Question

A crane raises a $5000kg$ steel girder at $0.4ms^{-1}$. Assuming that work is not lost in driving the crane, what is the power of the crane's engine? (gravity is 9.8)