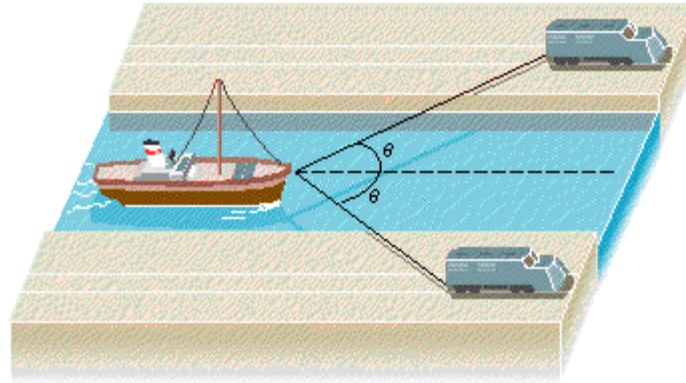


Assignment Preview

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1. CJ6 6.P.002. [239541] The drawing shows a boat being pulled by two locomotives through a canal of length 4.00 km. The tension in each cable is 4.00×10^3 N, and $\theta = 19.0^\circ$. What is the net work done on the boat by the two locomotives?

 [3.03e+07] J


2. CJ6 6.P.008. [239544] A 46 kg box is being pushed a distance of 7.0 m across the floor by a force \mathbf{P} whose magnitude is 150 N. The force \mathbf{P} is parallel to the displacement of the box. The coefficient of kinetic friction is 0.25. Determine the work done on the box by each of the four forces that act on the box. Be sure to include the proper plus or minus sign for the work done by each force.

applied force

 [1050] J

frictional force

 [-789] J

normal force

 [0] J

gravity

 [0] J

A 0.054 kg arrow is fired horizontally. The bowstring exerts an average force of 75 N on the arrow over a distance of 0.75 m. With what speed does the arrow leave the bow?

 [45.6] m/s

4. CJ6 6.P.018. [239548] A 7.0×10^4 kg space probe is traveling at a speed of 11000 m/s through deep space. Retrorockets are fired along the line of motion to reduce the probe's speed. The retrorockets generate a force of 4.5×10^5 N over a distance of 2700 km. What is the final speed of the probe?

 [9290] m/s

5. CJ6 6.P.030. [294546] When an 81.0 kg adult uses a spiral staircase to climb to the second floor of his house, his gravitational potential energy increases by 1.80×10^3 J. By how much does the potential energy of a 16.5 kg child increase when the child climbs a normal staircase to the second floor?

 [367] J

(a) How high would it go if there were no air friction?

[37.2] m

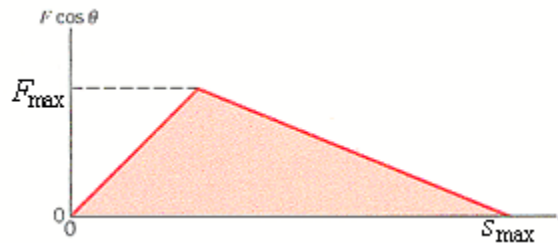
(b) If the projectile rises to a maximum height of only 29.8 m, determine the magnitude of the average force due to air resistance.

[3.53] N

11. CJ6 6.P.058. [239568] A 1.80×10^2 kg piano is being lifted at a steady speed from ground level straight up to an apartment 12.0 m above the ground. The crane that is doing the lifting produces a steady power of 4.00×10^2 W. How much time does it take to lift the piano?

[52.9] s

The graph shows how the force component $F \cos \theta$ along the displacement varies with the magnitude s of the displacement.



If $F_{\max} = 65.0$ N and $s_{\max} = 1.35$ m, find the work done by the force. (related to the triangle's base and height.)

[43.9] J

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