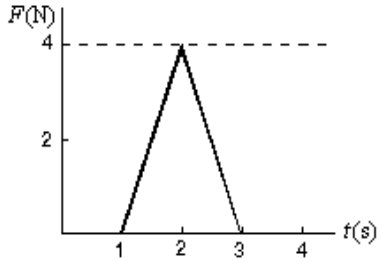
Chinese Name: Student number

Purdue Chap. 8 quiz 12/13 '22

1. A 640-N hunter gets a rope around a 3200-N polar bear. They are stationary, 20 m apart, on frictionless level ice. When the hunter pulls the polar bear to him, the polar bear will move:

A) 1.0 m B) 3.4 m C) 10 m D) 12 m E) 17 m

2. A 5-kg object can move along the *x* axis. It is subjected to a force $\vec{F}$ in the positive *x* direction; a graph of *F* as a function of time *t* is shown below. Over the time the force is applied the change in the velocity of the object is:



A) 0.8 m/s B) 1.3 m/s C) 1.6 m/s D) 2.3 m/s E) 4.0 m/s

3. The force on a particle is given by $F(t) = 0.71\,t + 1.2\,t^2$, in N. If the force acts from $t = 0$ to $t = 2.0$ s, the total impulse is:

A) 1.2 kg·m/s B) 1.9 kg·m/s C) 4.6 kg·m/s D) 4.8 kg·m/s E) 6.2 kg·m/s

4. A 3-g bullet is fired horizontally into a 10-kg block of wood suspended by a rope from the ceiling. The block swings in an arc, rising 3 mm above its lowest position. The velocity of the bullet was:

A) unknown since the heat generated in the collision was not given

B) 8.0×10^2 m/s C) 24.0 m/s D) 8.0 m/s E) 2.4×10^4 m/s

5. A 2-kg cart, traveling on a horizontal air track with a speed of 3 m/s, collides with a stationary 4-kg cart. The carts stick together. The impulse exerted by one cart on the other has a magnitude of:

A) 0 N·s B) 4 N·s C) 6 N·s D) 9 N·s E) 12 N·s

More problems on the back!

6. Blocks A and B are moving toward each other along the *x* axis. A has a mass of 2.0 kg and a velocity of 50 m/s, while B has a mass of 4.0 kg and a velocity of –25 m/s. They suffer an elastic collision and move off along the *x* axis. The kinetic energy transferred from A to B during the collision is:

A) 0 J B) 2500 J C) 5000 J D) 7500 J E) 10000 J

7. Two objects, X and Y, are held at rest on a horizontal frictionless surface and a spring is compressed between them. The mass of X is 2/5 times the mass of Y. Immediately after the spring is released, X has a kinetic energy of 50 J and Y has a kinetic energy of:

A) 20 J B) 8 J C) 310 J D) 125 J E) 50 J

8. A rocket exhausts fuel with a velocity of 1500 m/s, relative to the rocket. It starts from rest in outer space with fuel comprising 80 per cent of the total mass. When all the fuel has been exhausted its speed is:

A) 3600 m/s B) 2400 m/s C) 1200 m/s D) 880 m/s
E) 400 m/s