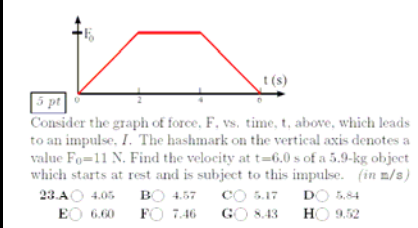


Impulse of a force and momentum (ch6)



Elastic collision (ch6)

5 pt

The mass m_1 enters from the left with velocity v_0 and strikes a mass $m_2 > m_1$ which is initially at rest. The collision between the blocks is perfectly elastic. The mass m_2 then compresses the spring an amount x . (positive velocities move to the right)

24. Immediately after colliding with m_2 , the velocity of mass m_1 is $2v_0$.
 A greater than B equal to
 C less than

25. Immediately after the collision, the energy of m_2 is the initial energy of m_1 .
 A greater than B equal to
 C less than

26. Immediately after the collision, the momentum of m_2 is the initial momentum of m_1 .
 A greater than B equal to
 C less than

27. The maximum energy stored in the spring is the initial energy of m_1 .
 A greater than B equal to
 C less than

Inelastic collision (ch6)

4 pt

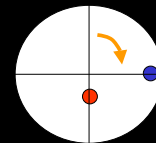
A 642 kg automobile slides across an icy street at a speed of 41.9 km/h and collides with a parked car which has a mass of 940 kg. The two cars lock up and slide together. What is the speed of the two cars just after they collide? (in km/h)

28. A 1.04×10^3 B 1.18×10^3 C 1.33×10^3
 D 1.50×10^3 E 1.70×10^3 F 1.92×10^3
 G 2.17×10^3 H 2.45×10^3

Rotational motion (ch7)

Two chips are placed on a wheel. The wheel starts to rotate with constant angular acceleration. Which chip slides off first?

- a) red, because it has largest moment of inertia
 b) blue, because it has smallest moment of inertia
 c) red, because it feels the smallest centrifugal force
 d) blue, because it feels the largest centrifugal force



Centripetal acceleration (ch7)

2 pt

A supersonic airplane is flying horizontally at a speed of 2590 km/h. What is the centripetal acceleration of the airplane, if it turns from North to East on a circular path with a radius of 57.0 km?

(in m/s^2)

29. A 1.64 B 2.18 C 2.90
 D 3.86 E 5.13 F 6.83
 G 9.08 H 1.21×10^3

2 pt

How much time does the turn take?
 (in min)

2 pt

How much distance does the airplane cover during the turn?

Gravitation (ch7)

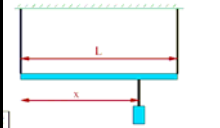
5 pt

A 255 kg satellite is orbiting on a circular orbit 6085 km above the Earth's surface. Determine the speed of the satellite. (The mass of the Earth is 5.98×10^{24} kg, and the radius of the Earth is 6370 km.)

(in km/s)

32. A 5.66 B 6.39 C 7.23
 D 8.17 E 9.23 F 1.04×10^3
 G 1.18×10^3 H 1.33×10^3

Torque (ch8)



Two wires support a massive beam of length $L=12$ m and mass 210 kg as shown. A box of mass of 140 kg hangs from a wire, which hangs from the beam a distance $x=9$ m away from the left edge of the beam. What is the tension in the RIGHT support wire?

Center of mass (ch8)

The center of mass of a solid object is always located within the material of the object.
a) True, b) False

Moment of inertia and rotational energy (ch8)

Two cylinders have the same mass and radius, and roll down the same incline. One is hollow, the other is not.

- 1) which one will arrive with the largest total kinetic to the bottom? a) the hollow cylinder b) the solid cylinder c) both will have the same total kinetic energy.

Moment of inertia and angular acceleration (ch8)

$\frac{1}{4}$ pt The work done in accelerating a flywheel from rest to an angular speed of 15.8 revolutions per second is 22.2 kJ. What is the moment of inertia of the flywheel?
(in $\text{kg}\cdot\text{m}^2$)

37. A 3.39 B 4.51 C 5.99 D 7.97
E 10.60 F 14.10 G 18.75 H 24.94

Conservation of angular momentum (ch8)

$\frac{1}{2}$ pt A figure skater is spinning with her arms and one leg extended as far as she can. She then pulls them in tight to her body. As her position contracts,

39. her angular momentum _____
A decreases B increases
C remains the same
40. her moment of inertia _____
A decreases B increases
C remains the same
41. her angular velocity _____
A decreases B increases
C remains the same

Pressure

- Which of the following statements is true:
- a) The pressure in A is larger than in B
- b) The pressure in D is smaller than in C
- c) The pressures in A, B, C and D are the same



Buoyant force (ch9)

4 pt A large tree trunk is floating in the sea. The density of the sea water is 1035 kg/m^3 , the density of the trunk is 670 kg/m^3 . What fraction of the trunk's volume is above the surface of the water?

43. **A** 0.226 **B** 0.282 **C** 0.353 **D** 0.441
E 0.551 **F** 0.689 **G** 0.861 **H** 1.076