Welcome back, Bill Wiecking

>>Working in AP Physics B (SC651)

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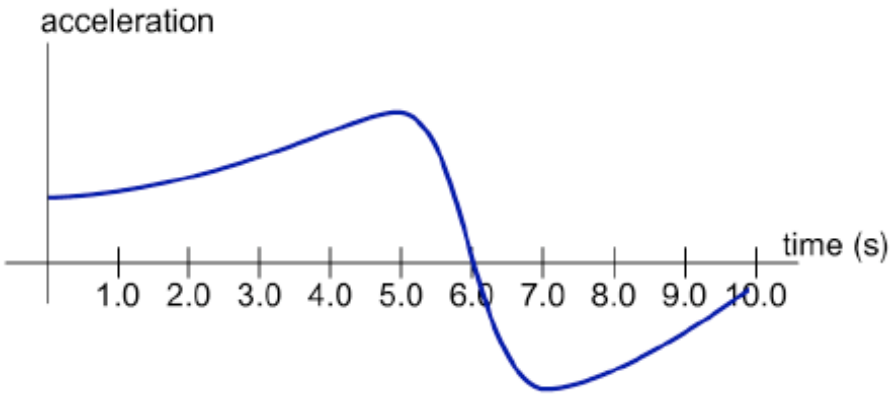
ch 5 exam

Chapter 5: Force and Newton's Laws

Section 5: Newton's second law

5.5.3 (5.00) In the illustration, you see the graph of an object's acceleration over time. (a) At what moment is it experiencing the most positive force? (b) The most negative force? (c) Zero force?



(a) _____ s

(b) _____ s

(c) _____ s

Section 14: Free-body diagrams

5.14.3 (5.00) A 17.0 N force *F* acting on a 4.00 kg block is directed at 30.0° from the horizontal, parallel to the surface of a frictionless ramp. Draw a free-body diagram of the forces acting on the block, including the normal force, and label the forces. Make sure the vectors are roughly proportional to the forces!

Submit answer on paper.

Section 19: Static friction

5.19.4 (7.00) A block of mass *m* sits on top of a larger block of mass 2*m*, which in turn sits on a flat, frictionless table. The coefficient of static friction between the two

blocks is μ_s.What is the largest possible horizontal acceleration you can give the bottom block without the top block slipping?

- $\mu_s g/2$
- $\mu_s g$
- $2\mu_s g$

Section 20: Kinetic friction

5.20.5 **(7.00)** A rescue worker pulls an injured skier lying on a toboggan (with a combined mass of 127 kg) across flat snow at a constant speed. A *L* m rope is attached to the toboggan at ground level, and the rescuer holds the rope taut at shoulder level. If the rescuer's shoulders are 1.65 m above the ground, and the tension in the rope is 148 N, what is the coefficient of kinetic friction between the toboggan and the snow?

Section 25: Sample problem: moving down a frictionless plane

5.25.1 **(5.00)** A child sits on a freshly oiled, straight stair rail that is effectively frictionless and slides down it. She has a mass of 25 kg, and the rail makes an angle of 40° above the ground. If she slides 4.0 m before reaching the bottom, what is her speed there?

m/s

Section 28: Hooke's law and spring force

5.28.3 **(5.00)** A spring with spring constant k = 15.0 N/m hangs vertically from the ceiling. A 1.20 kg mass is attached to the bottom end of the spring, and allowed to hang freely until it becomes stationary. Then, the mass is pulled downward 10.0 cm from its resting position and released. At the moment of its release, what is (a) the magnitude of the mass's acceleration and (b) the direction? Ignore the mass of the spring.

(a) m/s^2

(b)

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