AP Physics C
Drozdoff 8–9
Quiz — Chapter 5, 9/18/2007

This quiz is two pages long. I highly advise remembering to flip it over after you have completed the first side. The number in parentheses following each question indicates the point value of the question.

1 What are the two principal classes of forces, in terms of how they act? Distinguish between them and cite an example of each. (4)

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2 State each of Newton's laws of motion in either equation or word form. *Newton did not state* $\mathbf{F} = m\mathbf{a}$ *or even* $\sum \mathbf{F} = m\mathbf{a}$*, so neither of those answers will be accepted. Besides, I've already told you that's one of my severest pet peeves.* (3)

Newton's First Law of Motion:

Newton's Second Law of Motion:

Newton's Third Law of Motion:

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3 (QQ5.1) Evaluate the following statements as true or false (½ each).

(**a**) It is possible to have motion in the absence of a force.

circle one: *true* *false*

(**b**) It is possible to have force in the absence of motion.

circle one: *true* *false*

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4 State either of the two assumptions made about Atwood machines. One half point of extra credit is available for stating both correctly. (1)

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5 In the Coulomb model of friction, of the coefficient of static friction μ_s and the coefficient of kinetic friction μ_k, which is typically larger? (1)

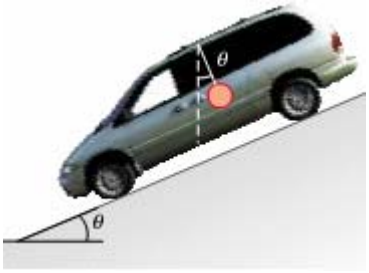
circle one: μ_s μ_k

6 (CQ17) If you push on a heavy box that is at rest, you must exert some force to start its motion. However, once the box is sliding, you can apply a smaller force to maintain that motion. Why? (2)

7 (CQ19) As a rocket is fired from a launching pad, its speed *and* acceleration increase with time as its engines continue to operate. Explain why this occurs even though the force of the engines exerted on the rocket remains constant. (2)

8 (P75) A van accelerates down a hill (figure), going from rest to $30.0\ \text{m}\cdot\text{s}^{-1}$ in $6.00\ \text{s}$. During the acceleration, a toy $(m = 0.100\ \text{kg})$ hangs by a string from the van's ceiling. The acceleration is such that the string remains perpendicular to the ceiling.

(**a**) Determine the angle θ. (3)



(**b**) Determine the tension in the string. (3)