

Planet Holloway **websheet 4.3**

AP Physics C - Chapter 4

You may print this out and write on it or work on your own paper.

Show all work.

1. Two penguins are connected by a 0.6 m string. The first penguin 3.2 kg is also attached to a 1.4 m string that is pulled by the evil biologist, Dr. Byaulijust. The second penguin has a mass of 4.8 kg. If the two penguins have an acceleration of 1.2 m/s/s, what is the tension in each cord?
2. A 12 kg banana and a 4.5 kg monkey are attached by a cord over a massless pulley. If the monkey cannot reach the banana what is the acceleration of the system? What is the tension in the connecting cord?
3. A 4 kg plate of brownies sits on a table with a coefficient of static friction of 0.4 and a coefficient of kinetic friction of 0.3. If the plate is attached to an 8 kg carton of milk by a cord that goes over a massless pulley, allowing the milk carton to hang free, what is the tension in the cord and the acceleration of the system?
4. An elevator weighing 12 000 N is supported by a 25 m cable. If the elevator is being accelerated upward at 2.2 m/s/s, what is the tension in the cable?
5. A clown car (mass = 880 kg) is accidentally left in neutral on a hill of 7° incline. If the parking brake fails, what will be the speed of the clown car after 4 seconds?
6. Captain Jake Seagull catches four sea turtles and lashes them together with rope made from the hair of his back forming a raft. If each turtle has a mass of 40 kg and can produce 50 N of thrust, how long will it take Captain Jake (85 kg) to travel 250 km back to his ship, the Mother of Pearl?

Answers:

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|---------------------------|--|
| 1. 5.76 N and 9.6 N | 4. 14 640 N |
| 2. 4.55 m/s/s and 65.45 N | 5. 9.75 m |
| 3. 34.68 N and 5.67 m/s/s | 6. 782.6 s or about 13 minutes (Them some fast turtles!) |