Unit 04 Review (Forces & Newton's Laws)

 $F_{NET} = ma$ $F_{NET} = \pm F_1 \pm F_2 \pm \cdots$ $F_G = mg$ $g = 9.8 \,\mathrm{m/s^2}$

1. A penguin by the name of Pickles (m=23 kg) is standing on a scale in an elevator on the top floor of a building. The elevator begins to go down towards the ground floor and does so by accelerating downward at 2.7 m/s^2 . What is the normal force?

2. A new sports car (m = 980 kg) is capable of applying a force of 5500 N with its engine. If the force of friction on the car is 500 N, what is the car's acceleration (assume no air resistance)?

3. You are pushing a large tub of chocolate, which has a mass of 455 kg, with an acceleration of 0.4 m/s^2 . The force of friction is 88 N. What is the force with which you are pushing the tub?

4. A fish (m = 9.1 kg) is pulled straight up out of the water by a fisherman. What is the acceleration of the fish if the force applied by the fisherman is 120 N?

Answers: (1) 163.3 N; (2) 5.10 m/s²; (3) 270 N; (4) 3.39 m/s²

(d) You are wearing roller blades and stand facing a brick wall. You push forward, against the wall,

but end up traveling backwards. Why?