Dynamics Problems – Additional

Name: _____ Date: _____

1. [5 marks] A 12 kg block is sitting on a rough floor. The coefficient of friction between the floor and the block is 0.34. The block is being acted upon by gravity (as usual) and 3 other forces. One of the forces is pulling up on the block with a force of 42 N; one is pushing to left with 200 N and the last force is pushing to the right with a force of 660 N. Calculate the distance the block would accelerate if it started from rest and accelerated to a speed of 12 m/s.

2. [5 marks] A 1100kg car is rushing down the road at 25 m/s. Air resistance on the car is pushing back on it with a force of 289 N. Friction between the road and tires was found to be 0.41. A spoiler on the car aids traction with a downward force of 54 N. Calculate the forward force supplied by the engine that would result in the car accelerating from its current speed to a new speed of 36 m/s in just 5.6 seconds.

3. [5 marks] Matrix the Monkey (15 kg) is in an elevator. He is standing on a scale and looks down to see that his weight is 197 N. Is the elevator moving at a constant speed, accelerating upward or accelerating downward? Explain. If it is accelerating determine the acceleration of the elevator.

4. [5 marks] Describe the concept of terminal velocity. Explain what terminal velocity is, why it occurs and what factors affect an objects terminal velocity. Why don't objects experience terminal velocity if falling in a vacuum? State relevant laws, etc.