

## 4.2 Quizlette - Vertical Acceleration (turn this in) Name \_\_\_\_\_

(use the convention that down is negative,  $g = 9.8 \text{ m/s/s}$ )

### Unknown Acceleration:

1. A 3.20 kg rocket has engines that deliver 38.0 N of thrust. What is the acceleration of the rocket?

2. A small elevator has a mass of 12.0 kg, and is suspended by a cable that has a tension of 92.0 N. What is its acceleration?

### Unknown force:

3. A 6.00 kg rocket accelerates upward at 32.0 m/s/s. What must be the thrust of the engines?

4. A 8.20 kg mass is on a cord and is accelerating downwards at 7.80 m/s/s. What is the tension in the cord?

1) 2.08 m/s/s (up), 2) -2.13 m/s/s (down), 3) 250.8 N, 4) 16.4 N

### **Kinematics then unknown force**

5. A 4.30 kg mass on a cord is moving upwards, and stops in a distance of 6.20 m in 2.10 seconds. What is the tension in the cord as it is stopping?

6. A small 14.0 kg elevator is moving downward at 8.90 m/s, and is stopped in a distance of 7.40 m. What is the tension in the cable supporting the elevator as it is stopping?

5) 30.0 N, 6) 212 N, 7) 63.5 m up, 8) 2.49 m

### **Unknown Acceleration then Kinematics:**

7. A 72.0 kg rocket has engines that generate a thrust of 1250 N. If it starts at rest, what is its elevation in 4.10 seconds?

8. A 62.0 kg climber is falling at 13.0 m/s, and is stopped by a force of 2710 N. In what distance will they stop?