Vertical Acceleration Questions from A4.2

Use the convention that up is positive.

+96.1 N +44.9 N +10.8 m/s/s +85.0 N -35.2 m	**1. A 6.32 kg flour baby hangs on a cord.** a. What is the tension in the cord if the flour baby is accelerating upwards at 5.40 m/s/s? b. If the flour baby is accelerating downwards at 2.70 m/s/s, what is the tension in the cord? c. If the tension in the cord is 130. N, what is the acceleration of the flour baby? d. If the flour baby is moving downwards at 5.50 m/s, and stops in 1.51 s, what was the tension in the cord during this time? e. There is a tension in the cord of 40.0 N. If the flour baby is initially at rest, what is the displacement of the flour baby 4.50 s later?
+32.5 m/s/s +19.5 N +9.82 N +3.61 N 1.20 s	**2. A 1.30 kg giant gerbil hangs on a cable.** a. If the upward force exerted by the cable is 55.0 N, what is the acceleration of the giant gerbil? b. What tension in the cable would cause the giant gerbil to accelerate upwards at 5.20 m/s/s? c. What is the tension in the cable if the giant gerbil has a downward acceleration of 2.26 m/s/s? d. The giant gerbil accelerates from rest to a downward velocity of 9.56 m/s in a distance of 6.50 m. What was the tension in the cable as it was doing this? e. There is a tension of 32.0 N in the cable. In what time can the giant gerbil change its velocity from rest to 17.8 m/s upwards?
+29.7 N +5.57 m/s/s +84.6 N +28.4 N +6.35 m/s	**3. A 5.20 kg baby koala hangs from a rope.** a. What is the tension in the rope if the koala is accelerating downwards at 4.10 m/s/s? b. If the tension in the rope is 80.0 N, what is the acceleration of the koala? c. What tension in the rope would effect an upward acceleration of 6.45 m/s/s? d. From rest, the koala displaces itself downward 7.20 m in 1.82 s. What is the tension in the rope as this is happening? e. If there is a tension of 58.0 N in the rope, what is the final velocity of the koala when it has risen 15.0 m if the koala started from rest?
-2.08 m/s/s +8.60 N +53.9 N +37.3 m/s +7.19 N	**4. A 2.20 kg giant cockroach rappels on a very strong string.** a. What is the acceleration of the cockroach if the tension in the string is 17.0 N? b. If the cockroach is accelerating downwards at 5.90 m/s/s, what is the tension in the string? c. What tension in the string would cause an upward acceleration of 14.7 m/s/s? d. If the tension in the string is 38.0 N, and the cockroach is initially at rest, what is the final velocity of the cockroach after 5.00 s? e. The cockroach is moving upwards at 6.45 m/s and stops in a distance of 3.18 m. What is the tension in the string as he is stopping?
+55.9 N -3.51 m/s/s +16.7 N -11.6 m +72.4 N	**5. A 4.60 kg gourd hangs on a cord.** a. What is the tension in the cord if the gourd is accelerating upwards at 2.35 m/s/s? b. What is the acceleration of the gourd if the tension in the cord is 29.0 N? c. If the gourd is accelerating downwards at 6.19 m/s/s, what is the tension in the cord? d. If the gourd starts from rest, and the tension in the cord is 28.0 N, what is the displacement of the gourd in 2.50 s? e. If the gourd accelerates from an upward velocity of 1.12 m/s to 6.57 m/s in a distance of 3.54 m, what is the tension in the cord?