Tension Practice – AP 1

1. A 2k bucket tied to a string accelerates downwards at 1m/s2. What is the force of tension in the rope? (18.6N)

* The same bucket and rope are pulled upwards at 1m/s2. The maximum tension the rope can withstand is 20N. Does it break? (T=21.6N, so yes)

1. Three boxes with masses 4kg, 7kg, and 10kg are hung one from the other from the ceiling using three ropes. The smallest mass is hung at the top, and the largest at the bottom. Find the tension in each rope (T3=39.2, T2=107.8N, T3=205.8N)
2. Three boxes with masses 1kg, 2kg, and 9kg are hung one from the other from the ceiling using three ropes. The largest mass is hung at the top, and the smallest at the bottom. Find the tension in each rope (T3=9.8N, T2=29.4N, T1=117.6N)
3. A 4kg is mass is suspended in a corner from two ropes. One rope is completely horizontal. One rope attaches above the mass and makes an angle of 67 degrees with the ceiling. Find the tension in each rope. [T1=42.6N, T2=16.64N]
4. An 8kg mass is suspended from a corner with two ropes. One rope is completely horizontal. The other makes an angle of 42 degrees with the ceiling. Find the tension in each rope. [T1=117.17N, T2=87.1N]
5. A12kg mass is suspended from two ropes. The first rope makes an angle of 40 degrees with the ceiling. The second rope makes an angle of 68 degrees with the ceiling. Find the tension in each rope. [T1=94.72N, T2=46.32N]

1. A 3kg mass is suspended from two ropes. The first rope makes an angle of 82 degrees with the ceiling. The second rope makes an angle of 71 degrees with the ceiling. Find the tension in each rope. [T1=21.1N, T2=9.01N]
2. A 3kg mass and a 5kg mass are held at equal heights over a frictionless pulley, connected by a string. Find the tension in the string and the acceleration of the system when the masses are released. [a=2.45m/s2, T=36.75N]
3. A 2kg mass and a 7kg mass are held at equal heights over a frictionless pulley, connected by a string. Find the tension in the string and the acceleration of the system when the masses are released. [a=5.4m/s2, T=30.49N]

1. Two 12kg masses are held at equal heights over a frictionless pulley, connected by a string. Find the tension in the string and the acceleration of the system when the masses are released [a=0m/s2, T=117.6]