

Draw FBDs for all problems!

1. A 550 kg elevator is at rest and is being held by a cable. Determine the tension forces in the cable.

2. A 25 kg sign hangs outside a restaurant and is being held by two cables. Determine the tension forces in each cable. (hint: the weight is distributed evenly between the two cables!)

3. A 12.0 kg bucket is lifted upwards with constant velocity by a rope. What is the tension in the rope?

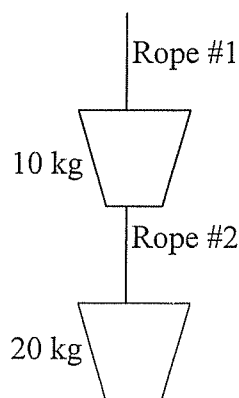
4. A 12.0 kg bucket is accelerated upwards at 0.60 m/s^2 by pulling a rope. What is the tension in the rope?

5. A 12.0 kg bucket held by a rope is accelerated downwards at 0.80 m/s^2 . What is the tension in the rope?

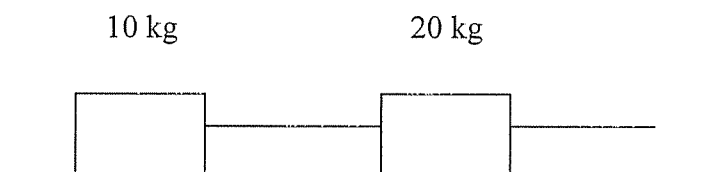
6. A 30.0 kg block is pulled along a table surface by a rope. If the table surface has a $\mu = 0.18$, what applied force (the tension force) in the rope necessary to accelerate the block at 1.5 m/s^2 ?

7. A 20.0 kg block is pulled along a table surface by a rope. If the table surface has a $\mu = 0.10$, what applied force (the tension force) in the rope necessary to accelerate the block at 2.5 m/s^2 ?

8. Two buckets are at rest as arranged in the diagram below. Determine the tension in each rope.



9. What is the tension in the rope that joins the two blocks that are pulled by a constant force of 500 N in the diagram below:



$\mu = 0.12$

10. Safety engineers estimate that an elevator can hold 15 persons of 80 kg average mass. The elevator itself has a mass of 500 kg. Tensile strengths show that the cable supporting the elevator can withstand a maximum force of $2.85 \times 10^4 \text{ N}$. What is the greatest acceleration that the elevator can attain without breaking the cable?