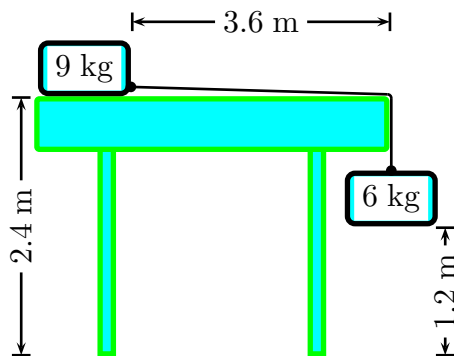


This print-out should have 20 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 (part 1 of 5) 10.0 points

Two objects are connected by a string of length 4.8 m and negligible mass. The 9 kg block is placed on a smooth table top, and the 6 kg block hangs over the edge of the table, as shown. The 6 kg block is then released from rest at a distance of 1.2 m above the floor at time $t = 0$.

The acceleration of gravity is 9.8 m/s^2 .



Determine the acceleration of the 6 kg block as it descends.

Answer in units of m/s^2 .

002 (part 2 of 5) 10.0 points

The 6 kg block strikes the floor and does not bounce.

How long does it take the 6 kg block to strike the floor?

Answer in units of s.

003 (part 3 of 5) 10.0 points

Describe the motion of the 9 kg block from the time $t = 0$ to the time when the 6 kg block strikes the floor.

1. It moves with a constant speed.
2. It stays still.
3. It moves with a decreasing acceleration.
4. It moves with an increasing acceleration.

5. It moves with a constant acceleration.

004 (part 4 of 5) 10.0 points

Describe the motion of the 9 kg block from the time the 6 kg block strikes the floor to the time the 9 kg block leaves the table.

1. It moves with an increasing acceleration.
2. It moves with a decreasing acceleration.
3. It stays still.
4. It moves with a constant acceleration.
5. It moves with a constant speed.

005 (part 5 of 5) 10.0 points

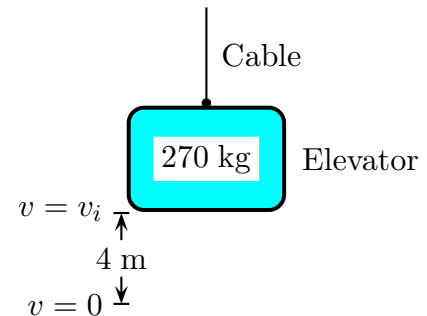
Determine the distance between the landing points of the two blocks.

Answer in units of m.

006 10.0 points

A descending elevator of mass 270 kg is uniformly decelerated to rest over a distance of 4 m by a cable in which the tension is 3636 N.

The acceleration due to gravity is 9.8 m/s^2 .



Calculate the speed v_i of the elevator at the beginning of the 4 m descent.

Answer in units of m/s .

007 (part 1 of 2) 10.0 points

A 7 kg object undergoes an acceleration of 2.4 m/s^2 .

What is the magnitude of the resultant force acting on it?

Answer in units of N.

008 (part 2 of 2) 10.0 points

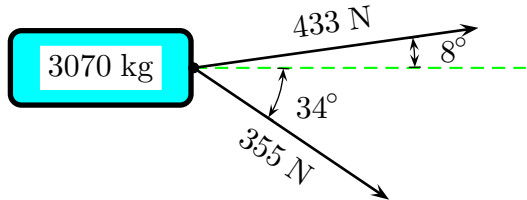
If this same force is applied to a 4.3 kg object,

what acceleration is produced?

Answer in units of m/s^2 .

009 (part 1 of 3) 10.0 points

Two forces, 433 N at 8° and 355 N at 34° are applied to a car in an effort to accelerate it.



What is the magnitude of the resultant of these two forces?

Answer in units of N.

010 (part 2 of 3) 10.0 points

Find the direction of the resultant force (in relation to forward, with counterclockwise considered positive).

Answer in degrees from the positive x -axis, with counter-clockwise positive, within the limits of -180° to 180° .

Answer in units of $^\circ$.

011 (part 3 of 3) 10.0 points

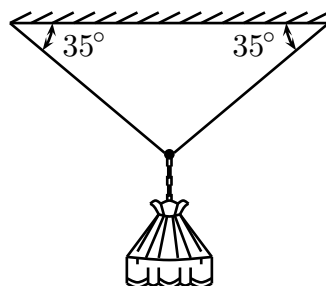
If the car has a mass of 3070 kg, what acceleration does it have?

Ignore friction.

Answer in units of m/s^2 .

012 10.0 points

Consider the 90 N light fixture supported as in the figure.



Find the tension in the supporting wires.

Answer in units of N.

013 10.0 points

A 8.8 kg bucket of water is raised from a well

by a rope.

The acceleration of gravity is 9.8 m/s^2 .

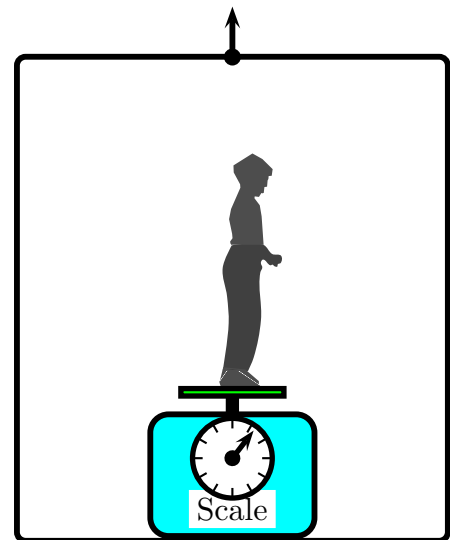
If the upward acceleration of the bucket is 5.9 m/s^2 , find the force exerted by the rope on the bucket.

Answer in units of N.

014 (part 1 of 4) 10.0 points

A 72 kg man stands on a spring scale in an elevator. Starting from rest, the elevator ascends, attaining its maximum speed of 1.4 m/s in 0.62 s . It travels with this constant speed for the next 7.5 s , undergoes a uniform negative acceleration for 1.52 s , and comes to rest.

The acceleration of gravity is 9.8 m/s^2 .



What does the spring scale register before the elevator starts to move?

Answer in units of N.

015 (part 2 of 4) 10.0 points

What does the spring scale register during the first 0.62 s ?

Answer in units of N.

016 (part 3 of 4) 10.0 points

What does the spring scale register while the elevator is traveling at constant speed?

Answer in units of N.

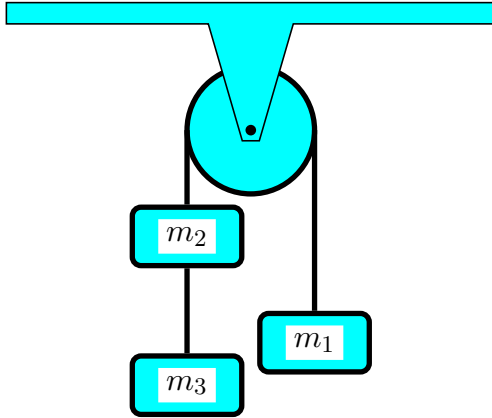
017 (part 4 of 4) 10.0 points

What does the spring scale register during the negative acceleration?

Answer in units of N.

018 (part 1 of 3) 10.0 points

Three masses are connected by light strings as shown in the figure.



The string connecting the m_1 and the m_2 passes over a light frictionless pulley.

Given $m_1 = 10$ kg, $m_2 = 7.48$ kg, $m_3 = 8.01$ kg, and $g = 9.8$ m/s². The acceleration of gravity is 9.8 m/s².

Find the downward acceleration of m_2 mass.

Answer in units of m/s².

019 (part 2 of 3) 10.0 points

Find the tension in the string connecting the m_1 and the m_2 masses.

Answer in units of N.

020 (part 3 of 3) 10.0 points

Find the tension in the string connecting the m_2 and the m_3 masses.

Answer in units of N.