

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

001 (part 1 of 2) 10 points

On planet X, an object weighs 6.48 N. On planet B where the magnitude of the free-fall acceleration is $1.61 g$ (where $g = 9.8 \text{ m/s}^2$ is the gravitational acceleration on Earth), the object weighs 25.38 N.

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

a) What is the mass of the object on planet X? Answer in units of kg.

002 (part 2 of 2) 10 points

b) What is the free-fall acceleration on planet X? Answer in units of m/s^2 .

003 (part 1 of 2) 10 points

A 2.89 kg book is dropped from a height of 2.0 m.

The acceleration of gravity is 9.81 m/s^2 .

a) What is its acceleration? Answer in units of m/s^2 .

004 (part 2 of 2) 10 points

b) What is its weight? Answer in units of N.

005 (part 1 of 2) 10 points

A bag of produce weighs 5.79 lb on Earth.

What should it weigh on the Moon, where the free-fall acceleration is $\frac{1}{6}$ that on Earth? Answer in units of N.

006 (part 2 of 2) 10 points

What should it weigh on Jupiter, where gravity is 2.64 times of that on Earth? Answer in units of N.

007 (part 1 of 4) 10 points

A(n) 94 kg boxer has his first match in the Canal Zone with gravitational acceleration 9.782 m/s^2 and his second match at the North Pole with gravitational acceleration 9.832 m/s^2 .

a) What is his mass in the Canal Zone?

Answer in units of kg.

008 (part 2 of 4) 10 points

b) What is his weight in the Canal Zone? Answer in units of N.

009 (part 3 of 4) 10 points

c) What is his mass at the North Pole? Answer in units of kg.

010 (part 4 of 4) 10 points

d) What is his weight at the North Pole? Answer in units of N.

011 (part 1 of 1) 10 points

Given: $g = 9.8 \text{ m/s}^2$.

Find the weight in pounds of 819 grams of salami. Answer in units of lb.

012 (part 1 of 2) 10 points

A block weighing 5.4 N requires a force of 2.9 N to push it along at constant velocity.

What is the coefficient of friction for the surface?

013 (part 2 of 2) 10 points

A weight \mathcal{W} is now placed on the block and 8 N is needed to push them both at constant velocity.

What is the weight \mathcal{W} of the block? Answer in units of N.

014 (part 1 of 3) 10 points

You are driving at the speed of 26 m/s (58.1728 mph) when suddenly the car in front of you (previously traveling at the same speed) brakes. Considering an average human reaction, you press your brakes 0.495 s later. Assume that the brakes on both cars are fully engaged and that the coefficient of friction is 0.921 between both cars and the road.

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

Calculate the acceleration of the car in front of you when it brakes. Answer in units of m/s^2 .

015 (part 2 of 3) 10 points

Calculate the braking distance for the car in front of you. Answer in units of m.

016 (part 3 of 3) 10 points

Find the minimum safe distance at which you can follow the car in front of you and avoid hitting it (in the case of emergency braking described here). Answer in units of m.

017 (part 1 of 3) 10 points

You are driving at the speed of 26 m/s (58.1728 mph) when suddenly the car in front of you (previously traveling at the same speed) brakes. Considering an average human reaction, you press the brakes 0.495 s later. Assume that the brakes on both cars are fully engaged and that the coefficient of friction is 0.921 between both cars and the road.

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

Calculate the magnitude of the acceleration of the car in front of you when it brakes. Answer in units of m/s^2 .

018 (part 2 of 3) 10 points

Calculate the braking distance for the car in front of you. Answer in units of m.

019 (part 3 of 3) 10 points

Find the minimum safe distance at which you can follow the car in front of you and avoid hitting it (in the case of emergency braking described here). Answer in units of m.

020 (part 1 of 1) 10 points

Once a 24 kg crate is in motion on a horizontal floor, a horizontal force of 60 N keeps the crate moving with a constant velocity.

The acceleration of gravity is 9.81 m/s^2 .

What is μ_k , the coefficient of kinetic friction, between the crate and the floor?