

POD #31

- 1) Define Newton's 1st Law
- 2) Give a real life example (that we did not cover in class) of Newton's 1st Law.
- 3) What is *inertia*?

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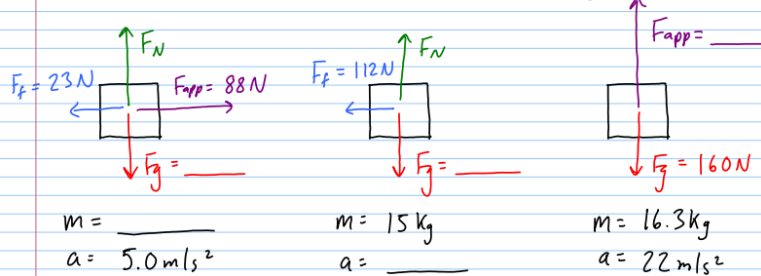
POD #32

- 1) A 72 kg astronaut finds themselves on the surface of Pluto. They stand on a scale and it reads 30.2 N.
 - a. What is the acceleration due to gravity on Pluto?
 - b. Imagine that the astronaut climbs into his rocket and blasts off from the surface of Pluto.
 - What would happen to his weight as he gets further from Pluto?
 - i) It gets smaller ii) It gets bigger iii) It stays the same
 - What would happen to his mass as he gets further from Pluto?
 - i) It gets smaller ii) It gets bigger iii) It stays the same
 - c. Explain your answers for part b.

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POD #33

For each of the situations shown below, determine the missing information.



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POD #34

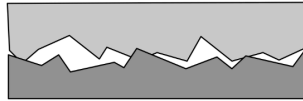
- 1) The Bugatti Veyron Super Sport can go from 0 to 100.0 Km/h in 2.46 s. If the car has a mass of 1888 kg, what is the average net force that it exerts while accelerating?
- 2) A 9.0 kg model rocket exerts a force of 350 N straight upwards. What is the acceleration of the rocket in this time. DRAW A FREE BODY DIAGRAM.



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POD #35

Microscopic view of two "smooth" surfaces in contact and sliding against each other.

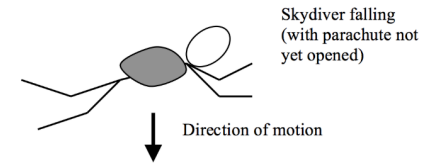


When two solid objects have surfaces that slide against each other, there is usually a *friction force* between the objects. Which statement is *false*?

- The friction force depends on the type of surfaces in contact.
- The friction force opposes the motion of the objects.
- The friction force depends in part on how fast the objects are sliding against each other.
- The friction force does *not* depend on the surface area of the objects.
- The friction force results from small irregularities in the two surfaces.

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POD #36



A skydiver who drops from a plane will accelerate downwards for awhile, and then reach a final *terminal velocity*. Which statement is true?

- At terminal velocity, the skydiver continues to accelerate at 9.8 m/s^2 downwards.
- At terminal velocity, the skydiver continues to accelerate, but at less than 9.8 m/s^2 , due to air friction.
- At terminal velocity, air friction is no longer a factor in the skydiver's fall.
- At terminal velocity, the velocity of the skydiver is 0.
- At terminal velocity, the force of gravity is balanced by the force of air friction.

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POD #37

A 0.150 kilogram hockey puck is at rest on the icy surface of a frozen lake. When the puck is hit by a 300 Newton force from a hockey stick, it begins to accelerate horizontally on the frictionless ice. The acceleration of the puck during the hit is

- 300 m/s^2
- 2000 m/s
- 300 m/s
- 2000 m/s^2
- 45 m/s^2

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POD #38

Hooke's law states that the force required to stretch a spring is proportional to the distance it is stretched. If you compress a spring, is this force negative?

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The motorcycle above is accelerating to the right. Which of the following statements is *false*?

- There is a friction force between the tires and the road that pushes the road to the left.
- There is a friction force between the tires and the road that pushes the motorcycle to the right.
- There is a force equal to its weight that the motorcycle applies down on the road.
- There is a force that the road applies upward on the motorcycle, that is equal to the its weight.
- The force of the road on the bike is greater than the force of the motorcycle on the road.

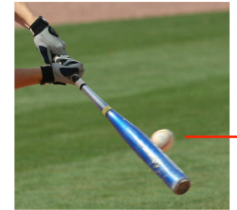


POD
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A baseball bat comes into contact with a baseball as shown above, applying a force to the right. Which of the following statements is *false*?

- The force of the bat on the ball is greater than the force of the ball on the bat.
- The force of the bat causes the ball to accelerate to the right.
- During the time of contact, the ball applies a force on the bat to the left.
- During the time of contact, the bat will accelerate to the left.
- That experiences a greater acceleration than the bat does.



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