1. Inertia is the tendency of an object to resist changes in its state of motion. JJ

2. The amount of inertia possessed by an object is dependent solely upon its mass. JM

3. Two bricks are resting on edge of the lab table. Shirley Sheshort stands on her toes and spots the two bricks. She acquires an intense desire to know which of the two bricks are most massive. Since Shirley is vertically challenged, she is unable to reach high enough and lift the bricks; she can however reach high enough to give the bricks a push. Discuss how the process of pushing the bricks will allow Shirley to determine which of the two bricks is most massive. What differences will Shirley observe and how can this observation lead to the necessary conclusion?

By pushing the bricks, shirley can feel inertia. Bricks of different mass will offer different degrees of resistance to the force. The brick with the greatest mass will have the most resistance. It's easy to feel the resistance with more mass.

4. Would Shirley Sheshort be able to conduct this same study if she was on a spaceship in a location in space far from the influence of significant gravitational forces? yes Explain your answer.

Although their weight would be different due to the change in gravity the bricks would still have inertia and mass AM

5. If a moose were chasing you through the woods, its enormous mass would be very threatening. But if you zigzagged, then its great mass would be to your advantage. Explain why.

The moose has a large amount of inertia because it is super big. So things like a moose with inertia have trouble changing direction. I could elude the moose CT

6. Inertia can best be described as _____.

a. the force that keeps moving objects moving and stationary objects at rest.
b. the willingness of an object to eventually lose its motion
c. the force that causes all objects to stop
d. the tendency of any object to resist change and keep doing whatever it's doing

AS

7. Mass and velocity values for a variety of objects are listed below. Rank the objects from smallest to greatest inertia.

B < A = C < D

GH

Object A	Object B	Object C	Object D
v = 2 m/s	v = 0 m/s	v = 4 m/s	v = 3 m/s
m = 10 kg	m = 20 kg	m = 5 kg	m = 8 kg

☆ C < D < A < B

T or F?	Statement
F	1. A force is required to keep an object moving in a given direction.
F	2. An upward moving object must be experiencing (or at least usually does experience) an upward force.
F	3. A rightward moving object must be experiencing (or at least usually does experience) a rightward force.
F	4. A ball is moving upwards and rightwards towards its peak. The ball experiences a force that is directed upwards and rightwards.
F	5. If a person throws a ball with his hand, then the force of the hand upon the ball is experienced by the ball for at least a little while after the ball leaves the hand.
F	6. A cannonball is shot from a cannon at a very high speed. The force of the explosion will be experienced by the cannonball for several seconds (or a least a little while).
F	7. If an object is at rest, then there are no forces acting upon the object.

T or F?	Statement
T	1. Objects do NOT weigh anything when placed in a vacuum.
T	2. All objects weigh the same amount when placed in a vacuum, regardless of their mass.
T	3. An object weighs less on the moon than it does on the Earth.
T	4. The mass of an object on the moon is the same as its mass on the Earth.
F	5. A high-speed object (say, moving at 200 mi/hr) will weigh less than the same object when at rest.
F	6. A high-speed object (say, moving at 200 mi/hr) will possess measurably more mass than the same object when at rest.
F	7. Weight is measured in pounds; mass is measured in Newtons.
T	8. A free-falling object still has weight.
F	9. Weight is the result of air pressure exerted upon an object.

An object at rest ... Will stay at rest ;

An object in motion .... stays in motion (constant) ;

unless ... acted upon by an unbalanced force. .

P

1. The amount of force required to keep a 6-kg object moving with a constant velocity of 2 m/s is __ N.
   a. 0.333 b. 2 c. 3 d. 6 e. 12
   (f.) ... nonsense! A force is NOT required to keep an object in motion.

2. Renatta Oyle is having car troubles. She is notorious for the trail of oil drops that she leaves on the streets of Glenview. Observe the following oil traces and indicate whether Renatta's car is being acted upon by an unbalanced force. Give a reason for your answers.

	Unbalanced Force?
a.  **Reason:** the car is speeding up	(Yes) or No
b.  **Reason:** Constant Velocity	Yes or (No)
c.  **Reason:** slowing down, spacing decreases	(Yes) or No

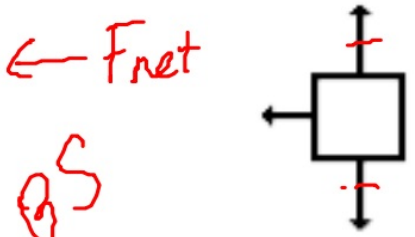
JS

H

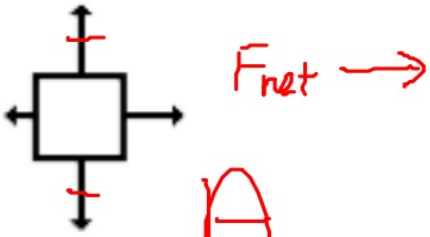
JM

ZF

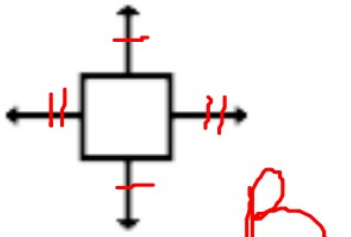
3. Each one of the dot diagrams in question #2 can be matched to a force diagram below. The force diagrams depict the individual forces acting upon the car by a vector arrow. The arrow direction represents the direction of the force. The arrow length represents the strength of the force. Match the dot diagrams from #2 to a force diagram; not every force diagram needs to be matched.



Dot Diagram(s): C



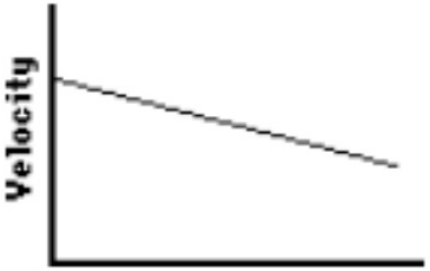
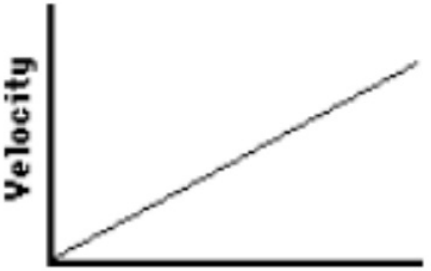
Dot Diagram(s): A



Dot Diagram(s): B

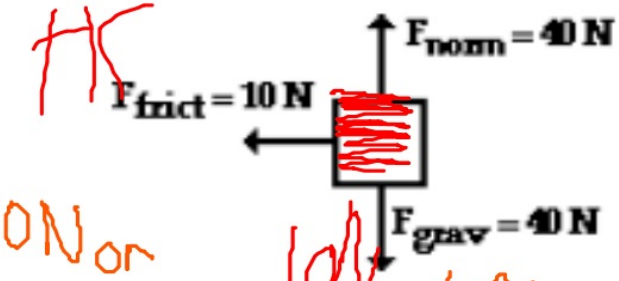
4. If the net force acting upon an object is 0 N, then the object MUST ____. Circle one answer.
   a. be moving b. be accelerating c. be at rest
   d. be moving with a constant speed in the same direction e. either c or d.

5. These graphs describe the motion of Carson Busses at various times during his trip to school. Indicate whether Carson's vehicle is being acted upon by an unbalanced force. Give a reason in terms of a description of what the car is doing (speeding up, slowing down, or constant velocity).

		
Unbalanced Force? Yes or No? Reason/Description: constant velocity	Unbalanced Force? Yes or No? Reason/Description: an acceleration (slowing down)	Unbalanced Force? Yes or No? Reason/Description: changing velocity (acceleration (speeding up)

6. A free-body diagrams show all the individual forces acting upon an object. The net force is the *vector sum* of all these forces (∑F). Determine the net force and state if there is an acceleration.

a.



∑F = 10N, left

Accel'n? Yes or No

b.

∑F = 0N

Accel'n? Yes or No

c.

∑F = 15 N, up

Accel'n? Yes or No

7. During an in-class discussion, Anna Litical suggests to her lab partner that the dot diagram for the motion of the object in #6b *could be*

. . . . . .

CB Anna's partner objects, arguing that the object in #6b could not have any horizontal motion if there are only vertical forces acting upon it. Who is right? Anna Explain.

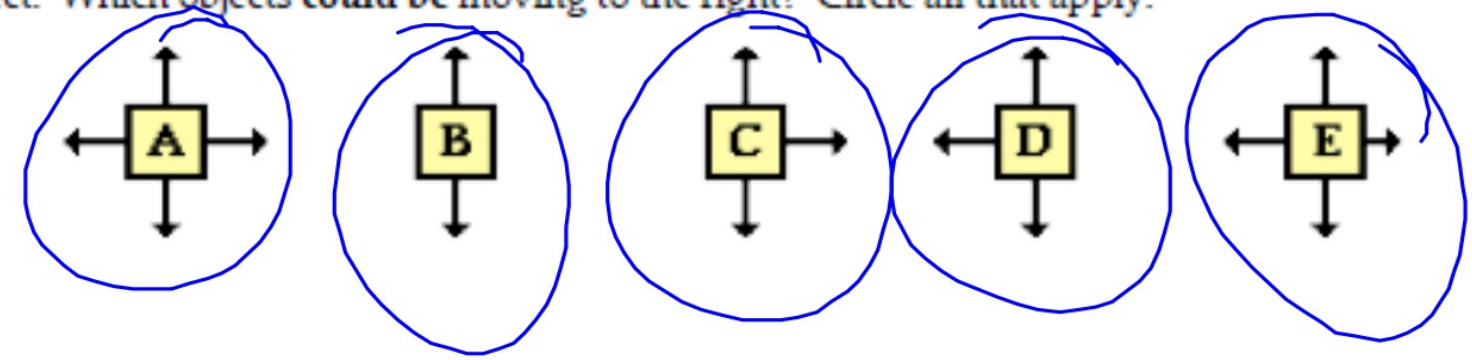
Because the horizontal forces have to be constant.

8. During an in-class discussion, Aaron Agin asserts that the object in #6a **must** be moving to the left since the only horizontal force acting upon it is a "left-ward" force. Is he right? _____ Explain.

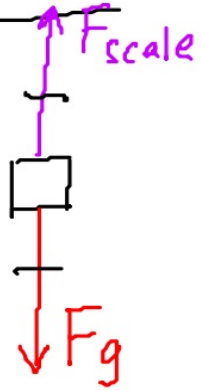
No. b/c in order for Fnet to be possible the object would need to be moving to the right & slowing down. BS

9. The diagrams below depict the magnitude and direction of the individual forces acting upon an object. Which objects **could be** moving to the right? Circle all that apply.

ZF



FBD



Given

$m = 200g$

$m = .2\ kg$

$g = 9.8\ m/s^2$

Unknown

$F_g = \_\_ N$

$F_{scale} = \_\_ N$

Equation

$F_g = mg$

$(F_g = F_{scale})$ so,

$F_{scale} = mg$

$= (.2)(9.8)$

$F_{scale} = 1.96\ N$

$F_{scale} = 2\ N$

1 SF!