## Newtons' Laws



## Physics 3210 Spring Semester 2019

If you buy a fish in an elevator and you want to get the best price, the elevator should be...

- A) Moving upwards with constant velocity
- B) Moving upwards with constant positive acceleration
- C) Moving upwards with constant negative acceleration

The net force on a box is in the positive *x* direction. Which of the following statements best describes the motion of the box?:

A) Its velocity is parallel to the *x* axis

B) Its acceleration is parallel to the *x* axis

C) Both its velocity and acceleration are parallel to the *x* axis

D) Neither its velocity nor its acceleration need be parallel to the x axis

A force **F** acts on a mass *M* during the time period from t = 0 to t = 1 as shown. At t = 1, the mass moves with velocity  $v_1$  as shown.



(c)

(b)

(a)

(d)

(e)

A force F is applied to a small block, that pushes a larger block. The two blocks accelerate to the right. Compare the NET FORCE on the block with mass M, to the net force on the block with mass 5M.

A)  $F_{M} < F_{5M}$ B)  $F_{M} = F_{5M}$ C)  $F_{M} > F_{5M}$ 



You are driving a car with constant speed around a horizontal circular track. The net force acting on your car

A) Points radially inward toward the center of the circular trackB) Points radially outward, away from the center of the circular trackC) Points forward in the same direction your car is movingD) Points backward, opposite to the direction your car is moving

E) Is zero.



You are driving a car with constant speed around a horizontal circular track. The momentum of your car

A) Points radially inward toward the center of the circular trackB) Points radially outward, away from the center of the circular trackC) Points forward in the same direction your car is movingD) Points backward, opposite to the direction your car is movingE) Is zero.



You are out for a run and you collide with a charging elephant. Who experiences the larger **force** during the collision?



## A) You

- B) The elephant
- C) Depends on who's running faster
- D) The forces are the same

You are out for a run and you collide with a charging elephant. Who experiences the larger **acceleration** during the collision?



## A) You

- B) The elephant
- C) Depends on who's running faster
- D) The accelerations are the same