Physics 100 Name: _____

Notes: Momentum and Impulse

Definition of Momentum:

Symbol: Why?

Formula:

Three ways to arrange the momentum formula:

Momentum Units:

Practice Using the Momentum Formula:

1. A 3kg goliath frog has a velocity of 2m/s. What's its momentum?

2. A 50kg pig has a momentum of 150kgm/s. What's the pig's velocity?

3. A farmer is chasing the pig. The farmer's velocity is 4m/s, and her momentum is 200kgm/s. What is the farmer's mass?

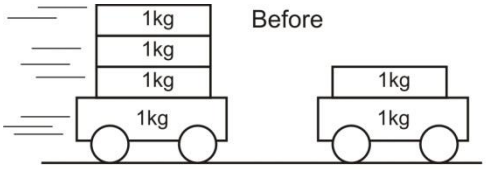
Is momentum a vector quantity or a scalar quantity? Why?

Net Momentum:

Law of Conservation of Momentum:

Practice Using the Law of Conservation of Momentum:

4.

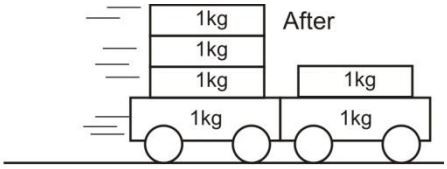


Before

m=____
v= 3m/s
p = ___

m= ___
v= 0m/s
p= ___

pnet = ____



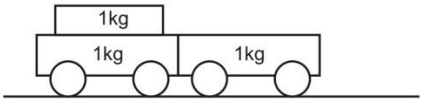
After

m =___
v= _____
p = _____

pnet = ____

5.

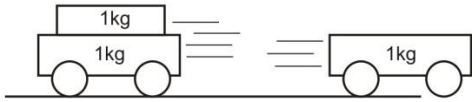
Before



m = ___
v= 0m/s
p = ___

pnet = ____

After



m = ___
v= -2m/s
p = _____

m = ___
v = _____
p = _____

pnet = ____

What is “impulse?”

Formula relating impulse to momentum:

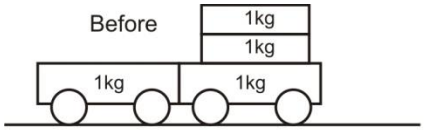
Units for impulse:

Three ways to rearrange the impulse/momentum formula:

6. A 2kg block of wood moving at a velocity of 5m/s slows to a stop over a time of 3 seconds. What net force brought the wood to a stop?

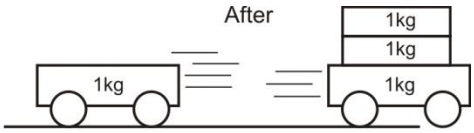
7. A 1,000kg car is rolling toward you at a velocity of 2m/s. In order to slow the car to a velocity of 1m/s by pushing against the car for 10 seconds, how hard will you have to push?

Conservation of Momentum Practice Problems (attach extra paper if necessary)



m = ___
v= 0m/s
p = ___

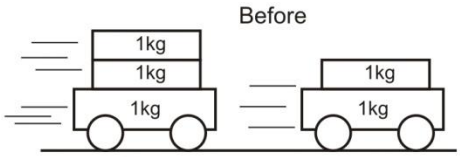
pnet = ____



m = ___
v= ___
p = _____

m = ___
v = 4m/s
p = _____

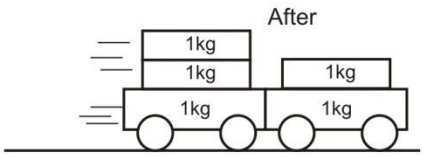
pnet = ____



m = ___
v= 5m/s
p = ___

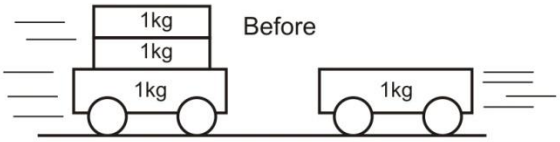
m = ___
v= 2m/s
p = ___

pnet = ____



m = ___
v= ___
p = _____

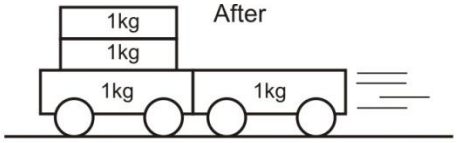
pnet = ____



m = ___
v= 2m/s
p = ___

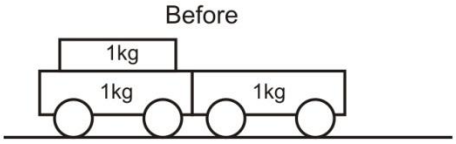
m = ___
v= -8m/s
p = ___

pnet = ___



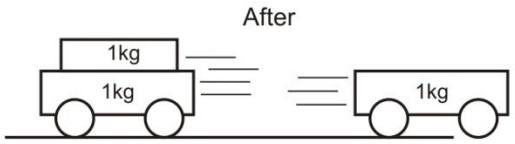
m = ___
v= ___
p = _____

pnet = ___



m = ___
v= 0m/s
p = ___

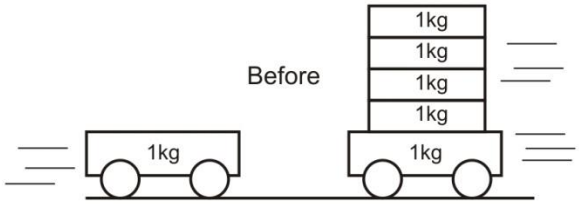
pnet = ___



m = ___
v= -6m/s
p = _____

m = ___
v = _____
p = _____

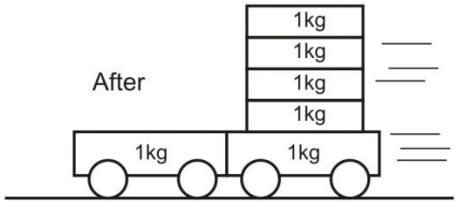
pnet = ___



m = ___
v= 2m/s
p = ___

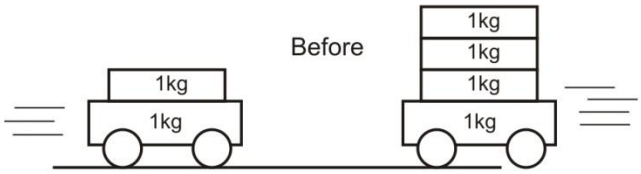
m = ___
v= -2m/s
p = ___

pnet = ___



m = ___
v = _____
p = _____

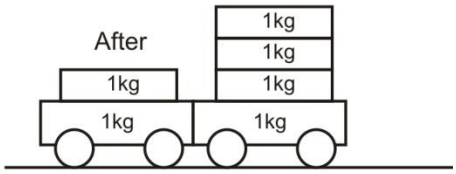
pnet = ___



m = ___
v= ___
p = _____

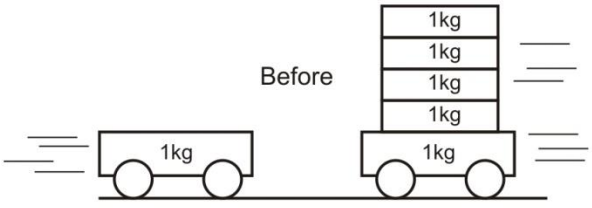
m = ___
v = 8m/s
p = _____

pnet = ___



m = ___
v= 0m/s
p = ___

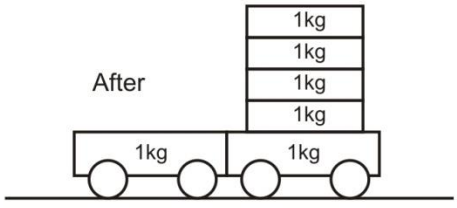
pnet = ___



m = ___
v= 5m/s
p = ___

m = ___
v= ___
p = ___

pnet = ___



m = ___
v = 0m/s
p = _____

pnet = ___