Physics 100 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notes: Momentum

Definition of Momentum:

Symbol: Why?

Formula:

Three ways to arrange the momentum formula:

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?

Momentum is a (vector or scalar) quantity:

Net Momentum:

Law of Conservation of Momentum:

Practice Using the Law of Conservation of Momentum:

4.

5.



What is “impulse?”

Formula for impulse:

Units for impulse:

Three ways to rearrange the impulse formula:

Where does the formula come from?

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?

**Impulse Practice Problems** (attach extra paper if necessary)

1. A block of wood was sitting still. Then a 20N net force was applied to a block of wood for a time of 3 seconds.

1. What is the wood’s change in momentum over those three seconds?
2. What was the wood’s starting momentum?
3. What was its momentum at the end of the three seconds?
4. If the wood’s mass was 5kg, what was its velocity at the end of those three seconds?

2. A bicyclist and his bicycle have a total mass of 100kg. When the bicyclist first appears, he is pedaling at a constant velocity of 10m/s. He stops pedaling, and over the next two seconds the bicyclist’s velocity decreases to 8m/s.

1. What is the bicyclist’s momentum when he first appears?
2. What is his momentum after 2 seconds?
3. What is his change in momentum?
4. What net force was applied to the bicyclist while he decelerated from 10m/s to 8m/s?

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

