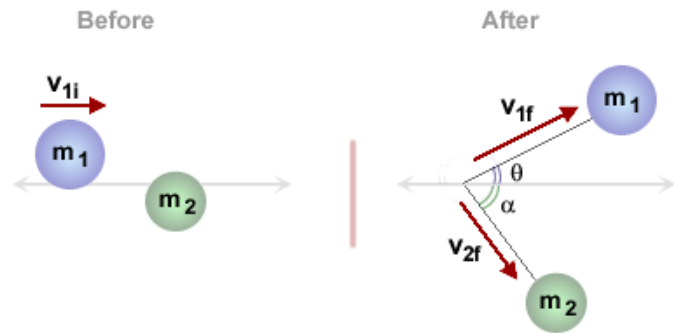


2 – Dimensional Conservation of Momentum Examples



Elastic (bounce off)

1. A 4.0 kg ball is rolling **eastward** at an unknown velocity when it hits a 6.1kg stationary ball. After the collision the 4.0 kg ball is travelling at a velocity of 2.8m/s 32° N of E and the 6.1 kg ball is travelling at a velocity of 1.5 m/s 41° S of E. Determine the velocity of the 4.0 kg ball before the collision.

Inelastic (stick together)

2. A 4.0kg Dog is travelling **south** at a velocity of 2.8m/s when it collides and holds onto another 6.0kg dog travelling 3.0m/s **east**. If the two dogs stay locked together for a moment, at what velocity (that includes direction) will the dogs travel after the collision?

Explosions

3. A 1000kg rocket is fired upward. At the instant it reaches a speed of 300m/s, it explodes into three fragments. One fragment (390kg) continues to move upwards at 1400m/s, the second (400kg) moves off at 240m/s to the east. What is the velocity of the third piece?

4. While on the runway during the grad fashion show, A 60 kg grad moving to the right at 9.0 m/s strikes a stationary 115 kg grad. If the final velocity of the 60kg grad is 5.5m/s at 23.0° above the horizontal, **determine** the final velocity of the 115kg grad.



5. A 6.0 kg ball with 192 J of kinetic energy was traveling when it collided with a stationary 2.3 kg ball. After the collision, the 2.3 kg ball traveled at 3.6 m/s at 47° to its original direction. Determine the magnitude and direction of the 6.0 kg ball's velocity after the collision.

