SPH4U

/10

Energy & Momentum Problems – Elastic Collisions

Name: _____ Date: _____

Gravitational Potential Energy: $E_g = mgh$ **Kinetic Energy:** $E_k = \frac{1}{2}mv^2$

Momentum: $p = mv$

1. [5 marks] Blocks A and B are pressed together with a spring between them. When the blocks are released from rest, the spring pushes the blocks apart so the 0.75kg block A moves up the 30° ramp to the left and the 0.25 kg block B moves to the right at v_{fB} = 3.0 m/s. Assume friction is negligible.

2. [5 marks] A cart is moving at 2 m/s at the top of a hill. It then rolls down the hill undergoes a completely elastic collision with a second cart that is also initially at rest. Determine the speeds of *cart 1* (5 kg) and *cart 2* (15 kg) after the collision. Assume a frictionless environment. Will *cart 1* make it back up the hill?