

Name: \_\_\_\_\_ Date: \_\_\_\_\_

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## Three-body Collisions Take home Assignment

In front of a hockey net, a 75.0-kg centre moving at 2.50 m/s [60.0° S of E] collides with an 85.0-kg defenseman moving at 1.80 m/s [20.0° S of W]. They entangle and slide into the stationary 80.0-kg goalie, pushing him back into the crease at 1.50 m/s [74.0° S of W]. What will be the velocity of the two entangled players immediately after colliding with the goalie?

Ignore any friction with the ice and rotational effects.

Given

$$m_c = 75.0 \text{ kg}$$

$$m_d = 85.0 \text{ kg}$$

$$m_g = 80.0 \text{ kg}$$

$$\vec{v}_{c_i} = 2.50 \text{ m/s [60.0° S of E]}$$

$$\vec{v}_{d_i} = 1.80 \text{ m/s [20.0° S of W]}$$

$$\vec{v}_{g_i} = 0 \text{ m/s}$$

$$\vec{v}_{g_f} = 1.50 \text{ m/s [74.0° S of W]}$$

before

