Physics 12: Collisions in 2D

1. Consider the collision below.

m=0.50kg

vI=12m/s

49o

v=14m/s

74o

m=3.0kg

v=15m/s

Find the following: a. The final velocity of the 0.50kg mass.

b. The impulse on the 0.50kg mass.

c. The impulse on the 3.0kg mass.

2. Consider the collision shown below.

1.0kg

4.0m/s 26o 3.2m/s

63o

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Find the final velocity of the 3.0kg mass.

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3. A rocket is floating in deep space (away from any gravitational effects). The mass of the rocket, and all of its contents, like space-food and water and computers and blankets and space-pillows and Karl and Yuri and Mirna and Wooram and all of the rocket fuel is 6256000kg. The rocket is travelling at 9450m/s. The rocket fires its thrusters sending a stream of hot burned rocket fuel gasses out the back end at 128000m/s (opposite the direction of motion). If the rocket ejects gas at a rate of 250.0kg/min, what is its speed after firing the thrusters for 1.000 hour?

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