

PHYSICS  
VECTOR MOMENTUM

NAME \_\_\_\_\_  
DATE \_\_\_\_\_ PERIOD \_\_\_\_

1. A careless kid on a bike (combined mass 50 kg) moving east at 4 m/s (approximately 8 mi/hr) collides with an 80 kg person walking north at 1 m/s. They become tangled together in the collision.

(a) Draw a vector diagram to scale. Use a scale of 1 cm = 20 kg m/s. Show the resultant momentum vector of the composite body after collision. **DON'T FORGET ARROWHEADS!**

(b) Measure the momentum vector of the composite body in cm, and show a simple unit analysis calculation for the magnitude of the momentum in kg m/s.

(c) What is the combined mass after collision? \_\_\_\_\_kg

(d) Find the magnitude of the velocity of the combined mass after collision (SHOW 4-PART SAMPLE CALCULATION).

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1. An explosion blows a 5.0 kg rock into three parts. Two pieces go off at right angles to each other; a 0.5 kg piece at 12.0 m/s at an angle of 90 degrees, and a 3.0 kg piece at 4.0 m/s at an angle of 0 degrees.

(a) On the axes below, draw a vector diagram to scale. Use 1 cm = 2 kg m/s. Show the resultant momentum vector of the first two pieces, and the momentum vector of the third piece. **DON'T FORGET ARROWHEADS!**

