

Don't turn this quiz in until you've marked it. The solution key will be emailed out on Wednesday!

Name: _____

Block: _____

MOMENTUM QUIZ #1
(/15)

1. How much momentum (magnitude and direction) does an 80.0 kg mass have if it is traveling at 22 m/s North? (1 mark)

2. A motor bike has a mass of 220.0 kg. A constant force acts upon it for 58.0 s. The bike's initial velocity is 23 m/s South and its final velocity is 52 m/s South.

(a) What change in momentum (magnitude and direction) does it undergo? (1 mark)

(b) What is the magnitude of the force which acts upon it? (1 mark)

3. (a) An 80.0 kg water skier moving forward at 18.0 m/s lets go of a towline. What is the magnitude of the impulse is needed to bring him to rest? (1 mark)

(b) The impulse is provided by the water, exerting an average backwards force of 270 N on the skier. How long will it take for the skier to come to rest? (1 mark)

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4. A 170 g hockey puck is moving East at 22 m/s, when it is struck by a hockey stick. After the impact, the puck is moving West at 43 m/s.

a) What impulse (magnitude and direction) did the stick give to the puck? (2 marks)

b) If the stick is in contact with the puck for 0.025 s, what is the average force (magnitude and direction) applied by the stick? (2 marks)

5. A 150 g baseball is thrown due east with an initial velocity of 39 m/s. It is struck by a bat, and rebounds due west. If the bat is in contact with the ball for 7.5×10^{-3} s, and the average force applied by the bat is 20400 N, find

a) the impulse (magnitude and direction) given to the ball (2 marks)

b) the final velocity (magnitude and direction) (3 marks)

6. What is the impulse (magnitude and direction) of a 2500 kg truck traveling West with a constant velocity of 34 m/s? (1 mark)