

Answers to Problem Sets on Momentum, Rotation and Angular Momentum

Sheet 1, Question 1: Completely elastic collisions conserve kinetic energy, while in completely inelastic collisions the bodies stick together.

Sheet 1, Question 2: (0.32 m/s, -0.67 m/s)

Sheet 1, Question 3: First velocity = -2.46 m/s, Second velocity = 0.84 m/s

Sheet 1, Question 4a: 8.5 m/s

Sheet 1, Question 4b: 9.9 m/s

Sheet 1, Question 4c: 10.5 m/s (this is the wheel that's most appropriate for a car)

Sheet 2, Question 1: North

Sheet 2, Question 2: (0.168 kgm²/s, 0.084 kgm²/s, -0.84 kgm²/s)

Sheet 2, Question 3a: 1.8×10^{40} kgm²/s

Sheet 2, Question 3b: 3.5×10^{39} kgm²/s

Sheet 2, Question 3c: 1.3×10^{43} kgm²/s

Sheet 3, Question 4: 0.135 s