1. Between which interval could the particle travel below and identify stability and instability points. What is the top speed of the particle if its mass is 50g?

2. Find the Force exerted at the point (3,2,1) if the potential energy is:

\[ U(r) = (2yz - x^2y + 2z^3xy) \]
3. A 1300 kg race car is traveling at 80 m/s while a 15,000 kg truck is traveling at 20 m/s. Which has the greater momentum?

4. A 300 kg snowmobile is traveling at 30 m/s. How fast would a 200 kg snowmobile need to travel to have the same momentum?

5. A group of people are pushing a stalled car with a mass of 1100 kg. If they push with a net force of 350 Newtons for 10 seconds, what is the car’s final velocity?

6. A car slams on its brakes while traveling at 27 m/s. If the coefficient of friction between the tires and the pavement is 0.6, for how much time does the car skid?

7. A 40g Superball™ strikes a wall with a velocity of 10 m/s that is normal to the wall. It bounces away at a velocity of 7 m/s, still normal to the wall. What is the ball’s change in momentum? If the bounce lasted 0.1 s, what is the force between the ball and the wall?

8. A rocket sled accelerates to 50 m/s. When the rocket engine stops, the sled skids along its rails. If the coefficient of friction is 0.5, how fast is the sled moving after 2.50 s?