

Chapter N2 Practice: Vector Calculus

Physics I

College of the Atlantic

1. A 0.5 kg bird is flying North at 4 m/s. Three seconds later it is flying West at 5 m/s. What is the bird's acceleration during this three-second time interval? What force is required for this acceleration? What interaction is responsible for this force?
2. Draw velocity and acceleration arrows for the motion diagram below. Estimate the magnitude of the acceleration. Assume $\Delta T = 0.1s$.
3. Draw a motion diagram for a ball rolling up an incline.
4. You are in an amusement park ride in which you get inside a cylinder which then spins in a circle. The radius of the cylinder is 2 meters. You stand with your back against the wall and the cylinder spins. If it makes three revolutions in one second, what is your acceleration? Is this safe? What force does the cylinder wall exert on you to make you accelerate in this way?

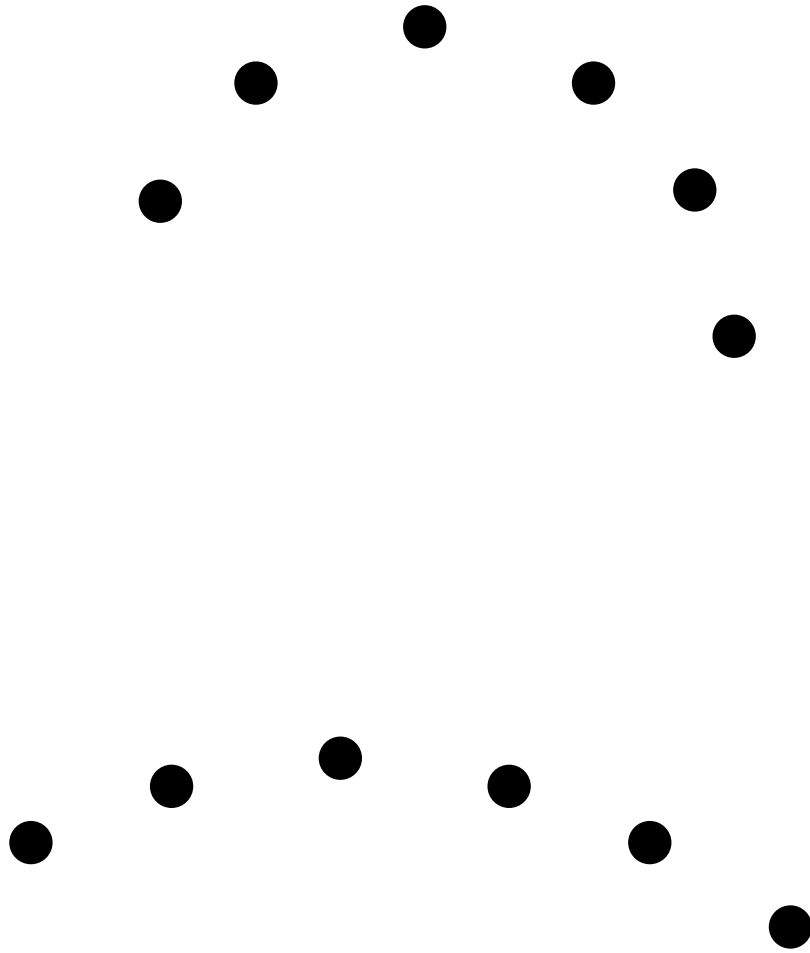


Figure 1: Another motion diagram