

Ex 7 Rudolph's trouble with the third law



But children do get their presents!! Let's help Rudolph with his physics ...

1 Is Rudolph right in his response to Santa?

2 How does Rudolph start moving forward?

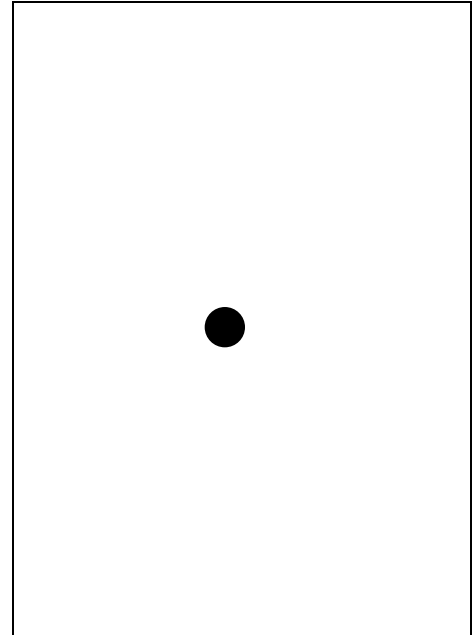
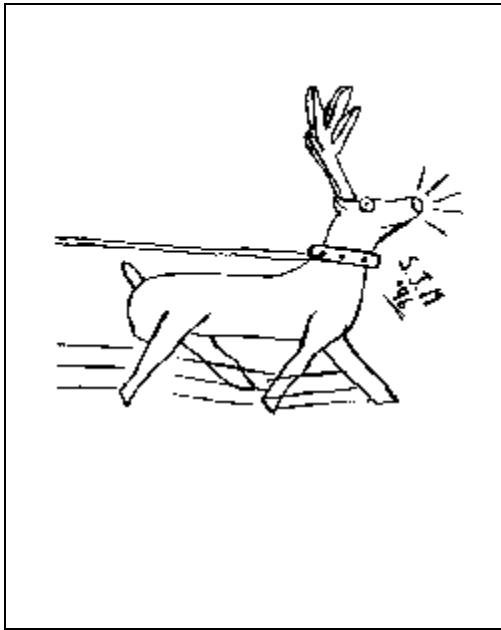
Please read the instructions in the box before attempting Questions 3 and 4 on Page 2

Represent forces

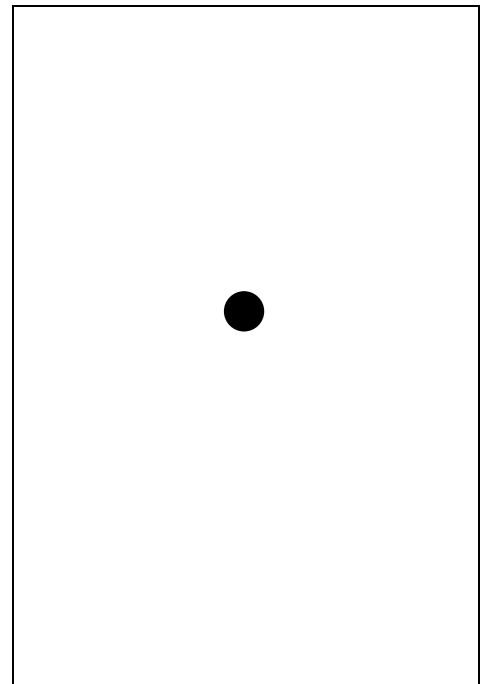
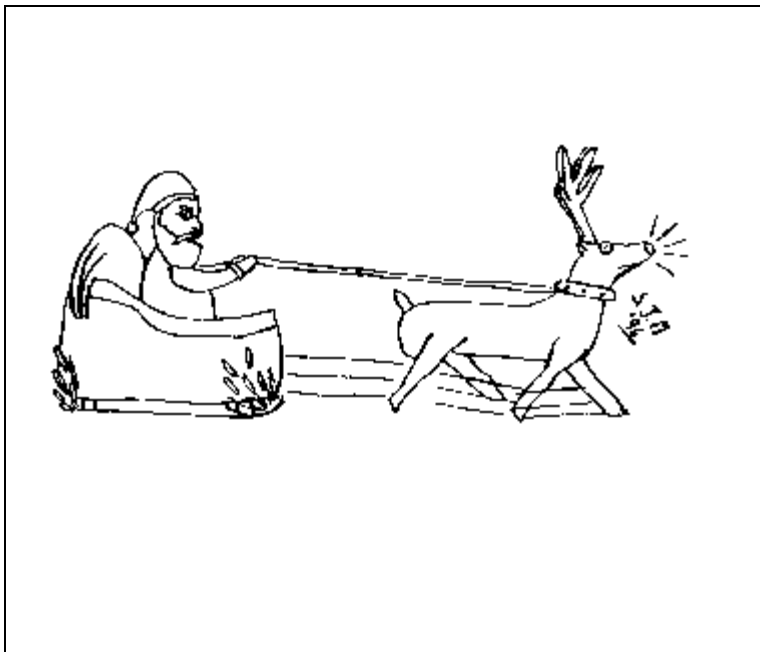
- using directed lines
- using the same scale for all forces within each diagram
- with as large a scale as possible to highlight the *relative* magnitudes
- with the tail of each directed line at the point where the force acts
- offsetting collinear forces to clarify the points where the forces act, and
- using the convention F_{AB} to label the force exerted on object A by object B.

NOW GO TO PAGE 2

- 3 What are the forces acting on Rudolph as he starts accelerating forwards? Draw these forces
 (a) on the picture of Rudolph (b) on the free body diagram.



- 4 What are the forces acting on the **system** of Rudolph and the sleigh as they start accelerating forwards? Draw these forces
 (a) on the picture of Rudolph and the sleigh (b) on the free body diagram.



- 5 You may wish to change your response to Questions 1 and 2. What is your final response to
 1 Is Rudolph right in his response to Santa?
 2 How does Rudolph start moving forward?