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### Worksheet 4: One-Dimensional Kinematics

1. A ball starts from rest and rolls down an incline at a constant acceleration. In 5.0 s, it rolls a distance of 50.0 m down the hill.

a. What is its acceleration?

b. If the same ball rolls down the same incline with the same acceleration, but begins with an initial downhill speed of 2.0 m/s, how far down the hill will it be in 5.0 s?

c. If the ball begins with an initial *uphill* speed of 2.0 m/s, where will it be in 5.0 s?

2. The human body can survive an acceleration trauma incident (sudden stop) if the magnitude of the acceleration is less than  $250 \text{ m/s}^2$ . If you are in an automobile accident with an initial speed of 30 m/s and you are stopped by an airbag that inflates from the dashboard, over what distance must you stop for you to survive the crash?

