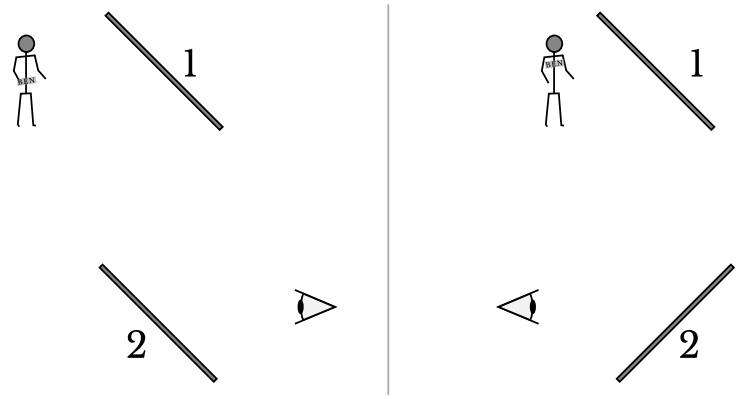
University Physics Problems 2

March 2013

1 Reflecting

Two periscopes are constructed as shown below. In each case, the periscope is used to observe a person with the word BEN written on their t-shirt. In each case, the light is reflected from mirror 1 to mirror 2 and then to the observer. For each design, what is the orientation of the word as viewed by the observer?



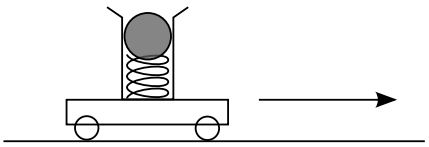
2 Recombining

A narrow beam of white light passes through a glass prism. The light is dispersed into its constituent colours. Can these rays be recombined into white light by passing them through a second prism?

3 Throwing

3.1

A trolley rolls without friction along a track. When the trolley passes over some point in the track, the ball is released and is ejected upwards. Does it fall



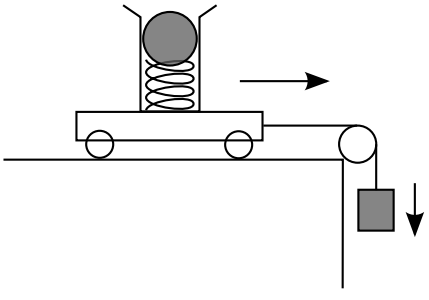
a) infront of the tube,

b) behind the trube,

c) back into the tube?

3.2

The trolley is now connected via a light string and a pulley whell to a weight and the experiement repeated. Does the ball fall



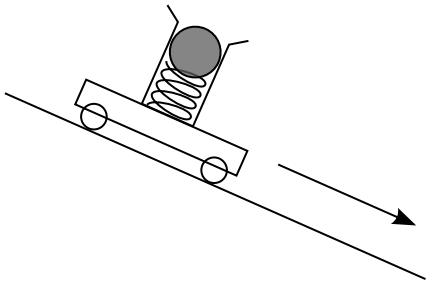
a) infront of the tube,

b) behind the trube,

c) back into the tube?

3.3

The trolley is now connected via a light string and a pulley whell to a weight and the experiement repeated. Does the ball fall



a) infront of the tube,

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c) back into the tube?