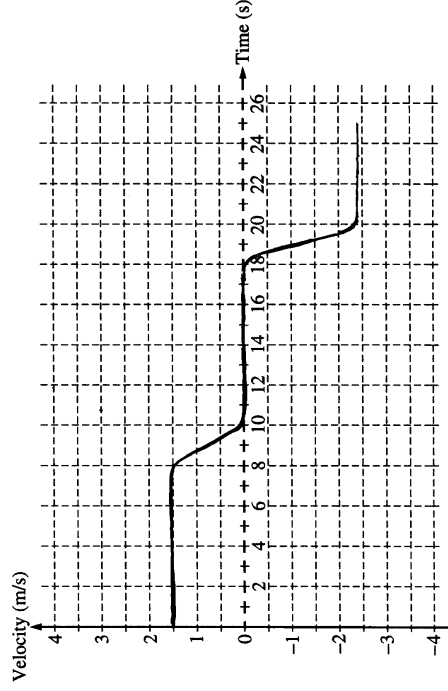


AP<sup>®</sup> PHYSICS B  
2005 SCORING GUIDELINES

Question 1

10 points total

(a) 4 points



The velocities can be found from the slope of the position graph.

For showing a positive velocity of magnitude 1.5 m/s (i.e., 12 m/8 s) between 0 s and 8 s inclusive

For showing zero velocity between 10 s and 18 s inclusive

For showing a negative velocity of magnitude 2.4 m/s (i.e., 12 m/5 s) between 20 s and 25 s inclusive

For showing two nonvertical transition regions; between  $t = 8$  s and 10 s and between  $t = 18$  s and 20 s

1 point

1 point

1 point

1 point

AP<sup>®</sup> PHYSICS B  
2005 SCORING GUIDELINES

Question 1 (continued)

Distribution of points

(b) (i) 3 points

For a definition or equation for average acceleration

$$a_{\text{avg}} = \Delta v / \Delta t \quad \text{OR} \quad v = v_0 + at$$

For the correct substitution from part (a)

$$a_{\text{avg}} = (0 - 1.5 \text{ m/s}) / 2 \text{ s}$$

For the correct answer including units and sign

$$a_{\text{avg}} = -0.75 \text{ m/s}^2$$

1 point

1 point

1 point

(ii) 1 point



For a correctly drawn vector, with or without a label

1 point

(c) 2 points

The acceleration is zero, so the normal force (apparent weight) is equal to the gravitational force.

For a correct relationship leading to a calculation of apparent weight

$$N = W = mg \quad \text{OR} \quad N - W = ma$$

$$W_{\text{app}} = (70 \text{ kg})(9.8 \text{ m/s}^2)$$

For the correct answer with units

$$W_{\text{app}} = 686 \text{ N} \quad (\text{or } 700 \text{ N using } g = 10 \text{ m/s}^2)$$

1 point

1 point