

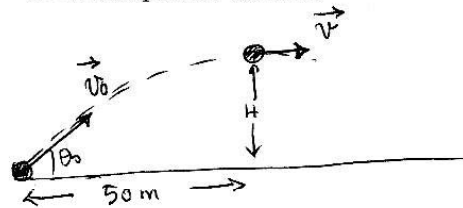
Physics 101Rec
 Quiz#3-Sect 06
 Chapters 4&5

Name: _____

Key

Id: _____

1. A ball is hit at ground level in a projectile motion. After 5.0 s the ball reaches its maximum height above the ground at a horizontal distance of 50 m from where it has been hit. What is the initial speed of the ball?



$$\vec{v}_0 = v_{0x} \hat{i} + v_{0y} \hat{j}$$

$$x - x_0 = v_{0x} t$$

$$50 = v_{0x} \times 5 \Rightarrow v_{0x} = 10 \text{ m/s}$$

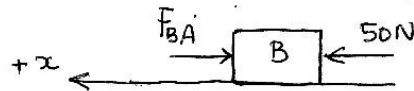
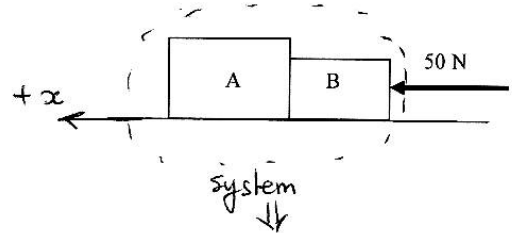
$$v_y = v_{0y} - g t$$

$$v_y = 0 \Rightarrow 0 = v_{0y} - 9.8 \times 5$$

at maximum height
 $\Rightarrow v_{0y} = 49 \text{ m/s}$

$$\vec{v}_0 = 10 \hat{i} + 49 \hat{j} \text{ m/s. speed} = \sqrt{10^2 + 49^2} = \boxed{50 \text{ m/s}}$$

2. Two blocks A (4.0 kg) and B (2.0 kg) are in contact with each other and are placed on a horizontal frictionless surface as shown in the figure. A 50 N constant force is applied to block B. What is the magnitude and direction of the force exerted by A on B.



$$50 - F_{BA} = m a = 2 \times 8.3 = 16.7$$

$$\sum F_x = m a_x = m a$$

$$50 = 6 a \Rightarrow a = 8.3 \text{ m/s}^2$$

$$\Rightarrow \boxed{F_{BA} = 33.3 \text{ N}} \text{ to the right!}$$