

Energy of a projectile WS 1

1. You throw a 700 gram ball upward with a velocity of 25 m/sec.

a) What is the kinetic energy of the ball as it leaves your hand?

b) Using conservation of energy, find the maximum height that the ball reaches. Assume your hand is at $y = 0$.

c) Find the maximum height of the ball using earlier methods.

2. A 200-g baseball is hit from a bat with a speed of 45 m/sec. The ball is caught by a fan in an upper deck 30 m above the playing field.

a) Do you expect that the speed of the ball when caught will be more than, less than, or equal to 45 m/sec? Explain your answer in terms of energy.

b) Find the speed of the ball when caught. (First fill in the energy bar chart.)

$$K_o + U_{go} + U_{so} + \text{Work} = K_f + U_{gf} + U_{sf} + U_{int}$$

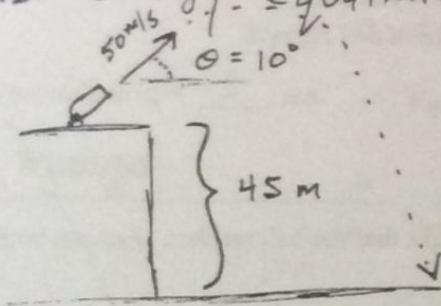
Energy of a Projectile

Find the impact velocity and maximum height reached

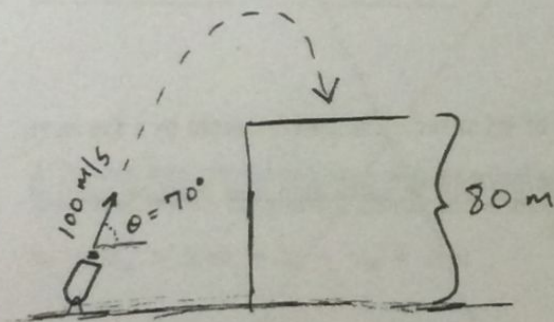
(A) Use kinematic equations only.

(B) Use energy equations only

#3



#4



#5

Explain why you agree or disagree with this statement:
"Using energy equations only, one can find air time."

Energy of a projectile

WS 2

1. You throw a 400 gram ball upward with a velocity of 55 m/sec.

a) What is the kinetic energy of the ball as it leaves your hand?

b) Using conservation of energy, find the maximum height that the ball reaches. Assume your hand is at $y = 0$.

c) Find the maximum height of the ball using earlier methods.

2. A 310-g baseball is hit from a bat with a speed of 40 m/sec. The ball is caught by a fan in an upper deck 30 m above the playing field.

a) Do you expect that the speed of the ball when caught will be more than, less than, or equal to 40 m/sec? Explain your answer in terms of energy.

b) Find the speed of the ball when caught. (First fill in the energy bar chart.)

$$K_o + U_{go} + U_{so} + \text{Work} = K_f + U_{gf} + U_{sf} + U_{int}$$

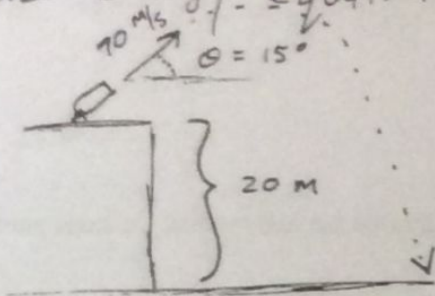
Energy of a Projectile

Find the impact velocity and maximum height reached

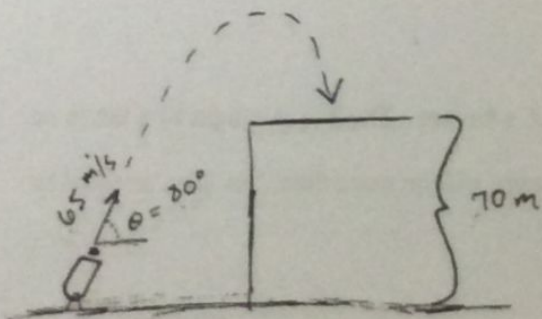
(A) Use kinematic equations only.

(B) Use energy equations only

#3



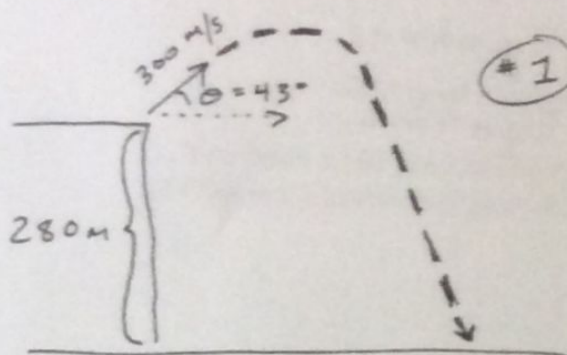
#4



Explain why you agree or disagree with this statement:

#5
An object that is launched at an angle has zero kinetic energy when it is at its apex (maximum height)

Energy of a projectile WS 3 Name: _____



#1 Using projectile motion concepts

Find:

V_x :

V_y :

Use $g = 9.8 \text{ m/s}^2$

Show all work!

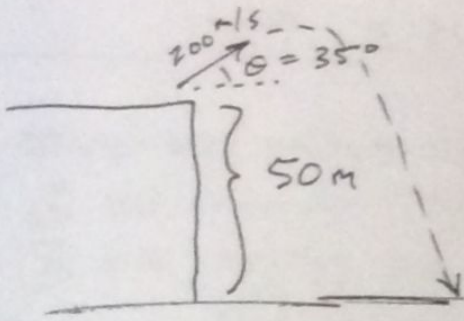
Mass = 10 kg

#2 Find impact velocity using projectile motion concepts:

#3 Find impact velocity using energy concepts:

#4 Which method of finding impact velocity was simplest? Why?

#5



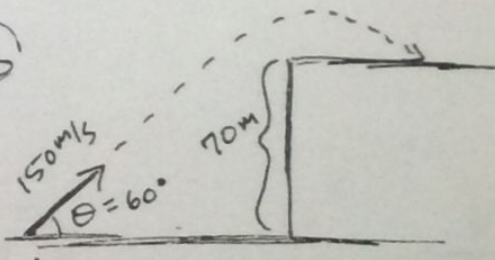
Find impact velocity using.

(a) Kinematic Equations

(b) Energy Equations

mass = 10 kg

#6



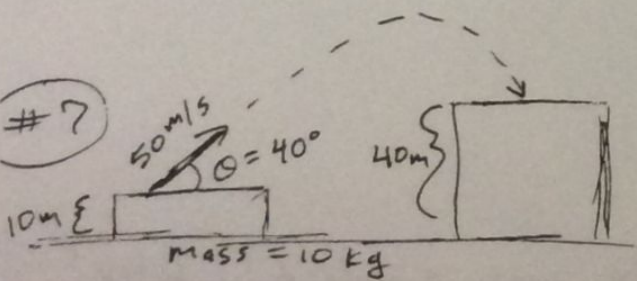
Find impact velocity using.

(a) Kinematic Equations

(b) Energy Equations

mass = 10 kg

#7



Find impact velocity using

(a) Kinematic Equations

(b) Energy Equations

Energy of a projectile 654

1. You throw a 500 gram ball upward with a velocity of 30 m/sec.

a) What is the kinetic energy of the ball as it leaves your hand?

b) Using conservation of energy, find the maximum height that the ball reaches. Assume your hand is at $y = 0$.

c) Find the maximum height of the ball using earlier methods.

2. A 145-g baseball is hit from a bat with a speed of 50 m/sec. The ball is caught by a fan in an upper deck 20 m above the playing field.

a) Do you expect that the speed of the ball when caught will be more than, less than, or equal to 50 m/sec? Explain your answer in terms of energy.

b) Find the speed of the ball when caught. (First fill in the energy bar chart.)

$$K_o + U_{g0} + U_{s0} + \text{Work} = K_f + U_{gf} + U_{sf} + U_{int}$$

A 6-kg ball is launched from the ground with a velocity of 25 m/sec. Find the velocity of the ball when it is 10 m above the ground. (Use energy.) There is no heat or work.

$$K_o + U_{go} + U_{so} = K_f + U_{gf} + U_{sf}$$

Extra point: Find the same answer using previous methods.