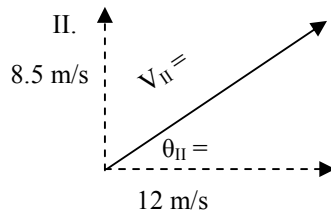# PreAP Two Dimensions 19
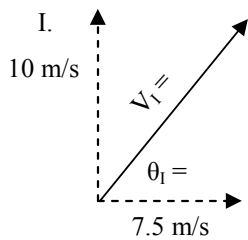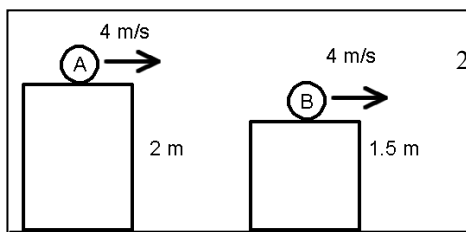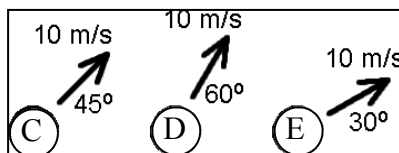
1. The diagrams below show the x and y components of the initial velocity of a projectile launched from the ground.

I.

10 m/s

$v_I =$

$\theta_I =$

7.5 m/s

II.

8.5 m/s

$v_{II} =$

$\theta_{II} =$

12 m/s

A. * Calculate the initial velocities and directions of both projectiles. Label them on the diagrams.

B. Projectile I or II:
    i.   ____ Has the greatest initial speed (velocity)?
    j.   ____ Has the greatest hang time (time in the air)?
    k.   ____ Has the greatest y-dir acceleration?
    l.   ____ Has the greatest x-velocity?
    m. ____ Has the greatest velocity at the top?
    n.   ____ Has the greatest speed as it slams into the ground?
    o.   ____ Has the greatest range. (*You will actually need to calculate this.*)

4 m/s

A

4 m/s

B

2 m

1.5 m

2. A or B?
    i.   __ Hits the ground last.
    j.   __ Greatest range.
    k.   __ Greatest initial y-velocity.

10 m/s

10 m/s

10 m/s

45°   60°   30°

C   D   E

3. C, D, or E?
    i.   ____ Hits the ground first.
    j.   ____ Greatest range.
    k.   ____ Greatest initial x-velocity.
    l.   ____ Greatest initial speed.

4. Draw the seven projectile motion graphs. Assume ground to ground.

y-pos   x-pos

y-pos   t

x-pos   t

y-vel   t

x-vel   t

y-acc   t

x-acc   t