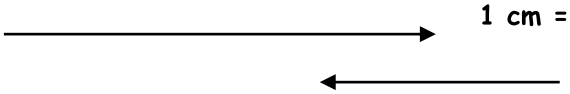
Vector and Projectiles Worksheet

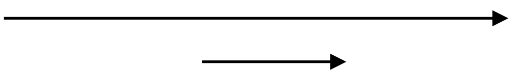
1. Draw the resultant for each of the following vector pairs. Label the magnitude of each vector and resultant based on the scales provided.

1 cm = 10 m

1 cm = 10 m/s

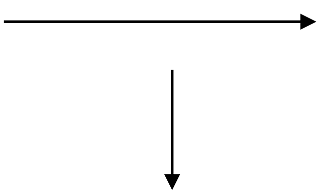


1 cm = 10 m/s^2

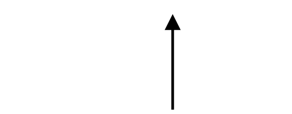


2. Draw the resultant for each of the following vector pairs. Label the magnitude of each vector and resultant based on the scales provided. Us Pythagorean's Theorem to verify the measured magnitude of the resultant.

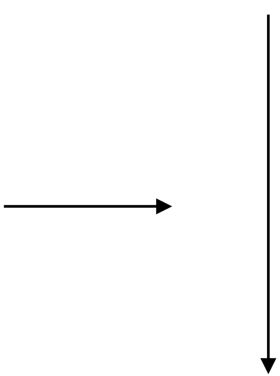
1 cm = 10 m



1 cm = 10 m/s



1 cm = 10 m/s^2



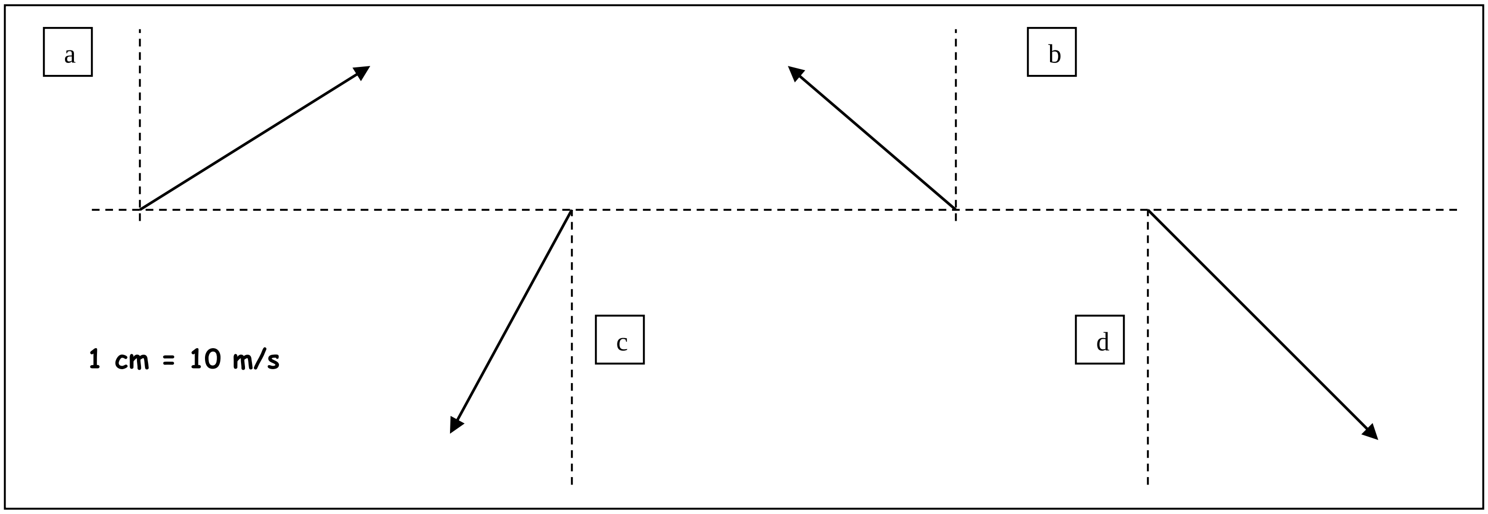
Vector and Projectiles Practice Worksheet

Vector Problems – complete each of the following word problems by drawing out the vectors.

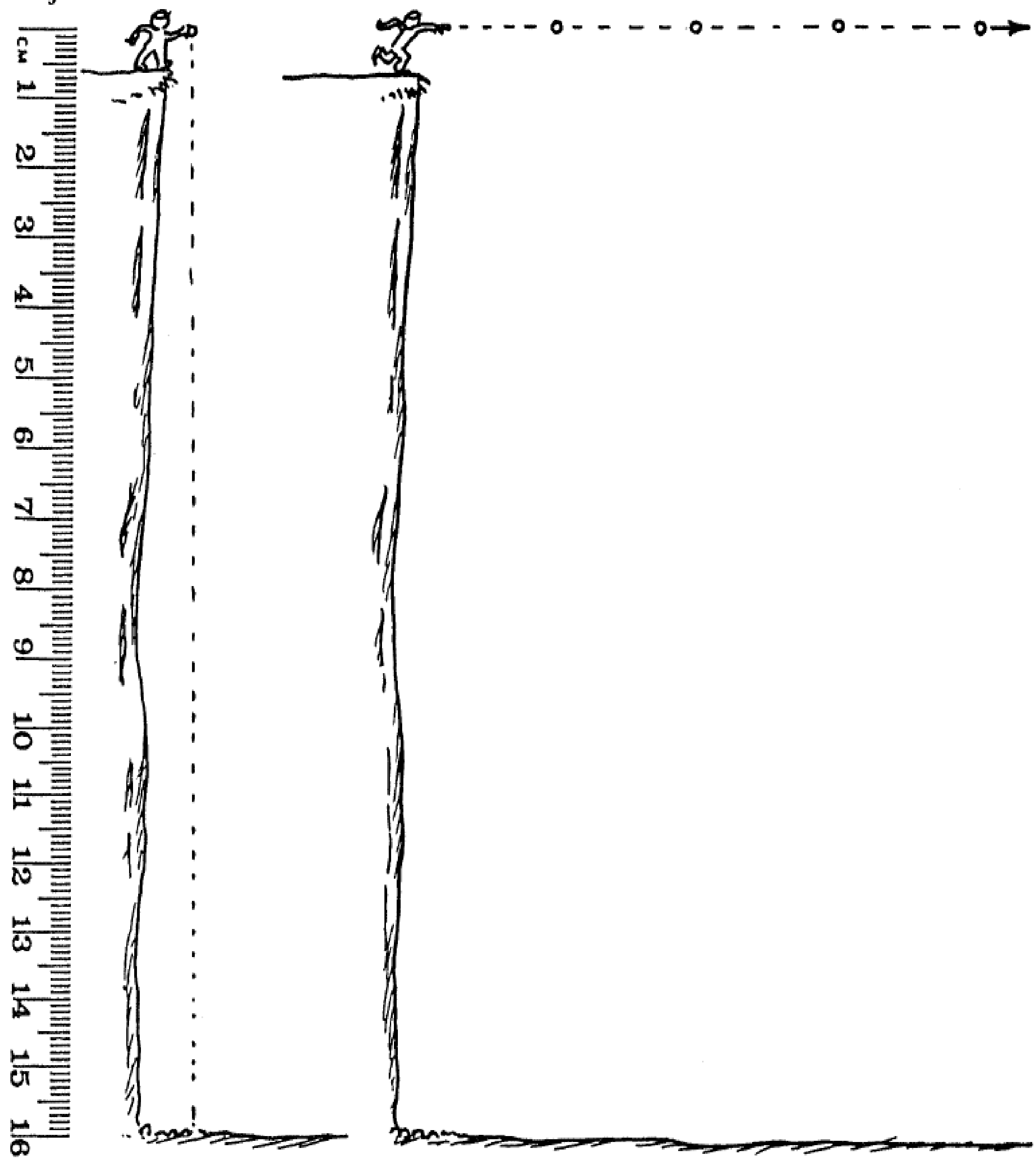
3. A person walks 40 m east and then 100 m south. Find the :
   (a) Distance the person walked
   (b) Displacement of the person from start to finish

4. A motor boat heads due west at 10 m/s across a river. The river flows due south at 6 m/s.
   (a) Find the resultant velocity of the boat as observed by a person on the river bank.
   (b) If the river is 200 m wide, how long does it take the boat to cross the river?
   (c) How far downstream is the boat when it reaches the other side?

5. Draw the horizontal and vertical components of each vector. Label the magnitude of each vector and component based on the scale provided.



Projectile Motion



6. Above left: Use the scale 1 cm: 5 m and draw the positions of the dropped ball at 1-second intervals. Neglect air drag and assume $g = 10\ \mathrm{m/s^2}$. Estimate the number of seconds the ball is in the air.

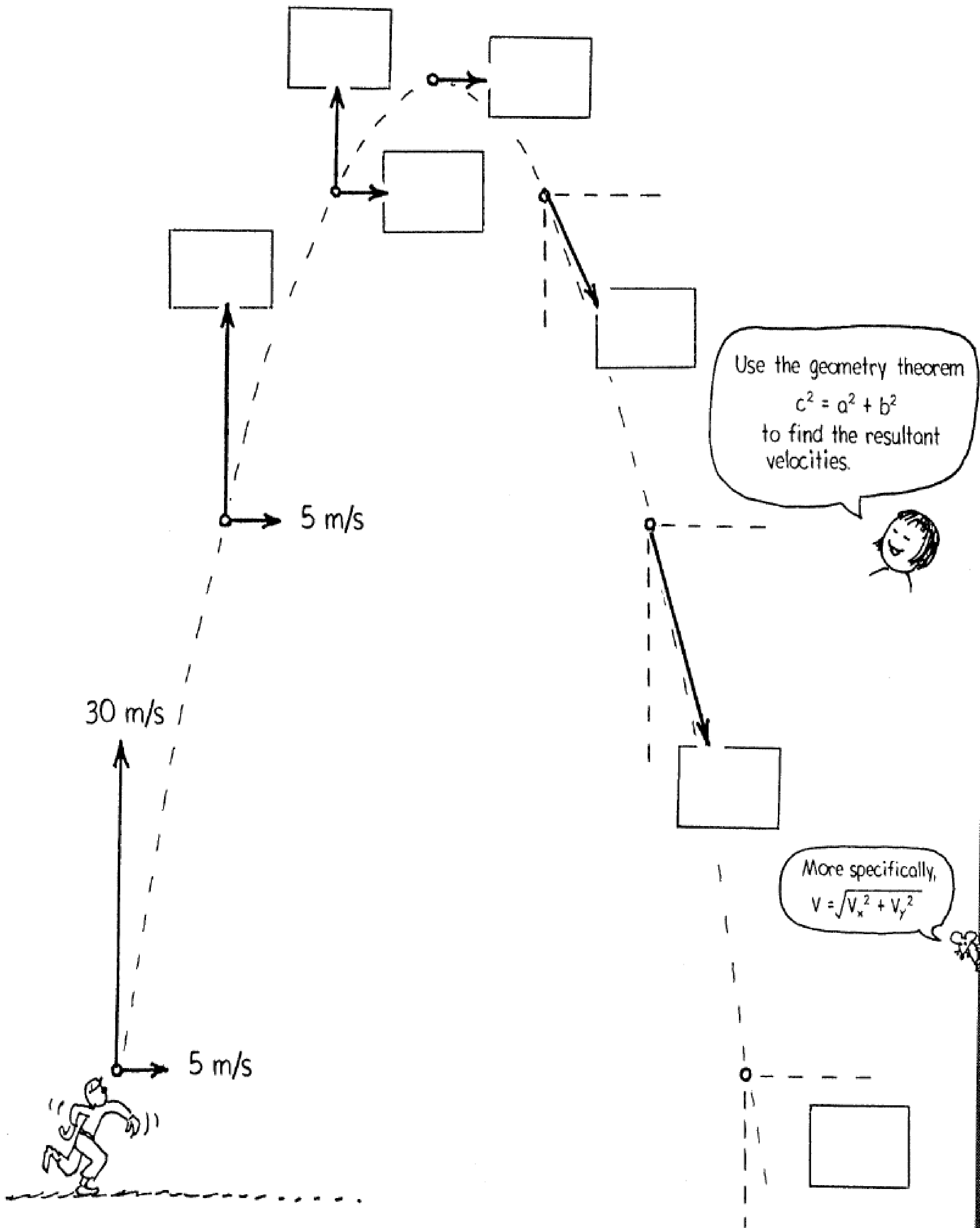
   ____________ seconds.

7. Above right: The four positions of the thrown ball with *no gravity* are at 1-second intervals. At 1 cm: 5 m, carefully draw the positions of the ball *with* gravity. Neglect air drag and assume $g = 10\ \mathrm{m/s^2}$. Connect your positions with a smooth curve to show the path of the ball. How is the motion in the vertical direction affected by motion in the horizontal direction?

   ____

Tossed Ball 8.

A ball tossed upward has initial velocity components 30 m/s vertical, and 5 m/s horizontal. The position of the ball is shown at 1-second intervals. Air resistance is negligible, and $g = 10\ \mathrm{m/s^2}$. Fill in the boxes, writing in the values of velocity ***components*** ascending, and your calculated ***resultant velocities*** descending.



Conceptual PHYSICS