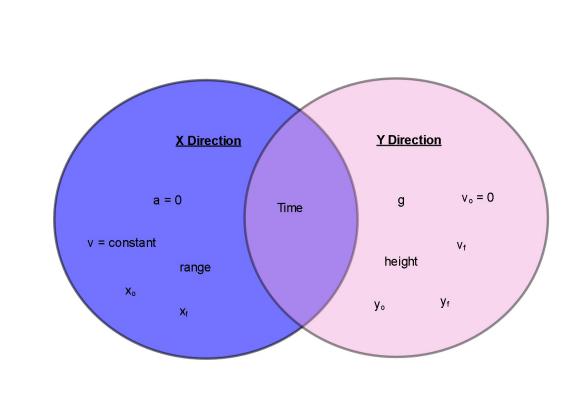
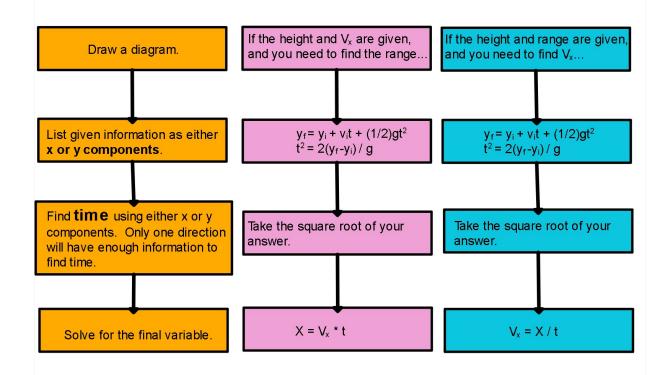
# 2-Dimensional Motion

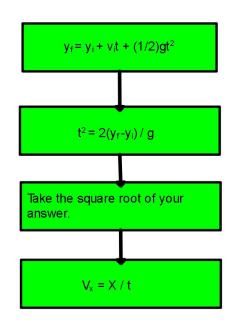


## For an object launched horizontally from some height...



### For an object launched horizontally from some height...

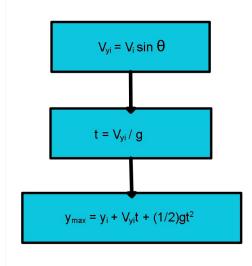
A ball is thrown horizontally from the top of a 20.00-m cliff. The ball lands at a distance of 50.00 m from the edge of the cliff. What is the initial horizontal velocity of the ball?



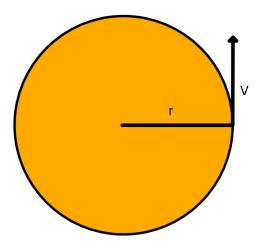
#### For an object launched at an angle from the ground... Find the x and y Draw a diagram. components of Viusing To find the total range... SOHCAHTOA If the angle is measured from the ground: List given information as either $V_{xi} = V_i \cos \theta$ x or y components. $x = V_{xi}t$ $V_{vi} = V_i \sin \theta$ If the angle is measured from the normal: $V_{xi} = V_i \sin \theta$ Find **time** using either x or y $V_{vi} = V_i \cos \theta$ components. Only one direction Remember to double the will have enough information to find time. $t = V_{vi}/g$ Keep in mind that this is the time for half of the flight. Solve for the final variable. $y_{max} = y_i + V_{yi}t + (1/2)gt^2$

For an object launched at an angle from the ground...

A player kicks a football at an angle of 42.0° above the horizontal. The football has an initial velocity of 10.0 m/s. Find the horizontal component of the velocity and the maximum height attained by the football.



# Centripetal Motion



$$a_c = v^2 / r$$
  
 $F_{net} = m * a_c$ 

## **Centripetal Motion**

A 0.50-kg ball is attached to a string of 0.50 m and swung in a horizontal circle with a velocity of 1.0 m/s. Find the centripetal force of the ball.

