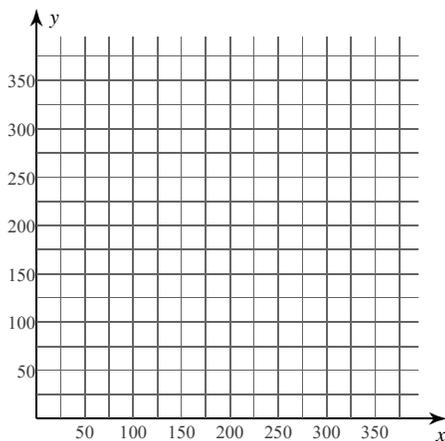


## Ideal Projectile Motion

Date \_\_\_\_\_ Period \_\_\_\_\_

- 1) A soccer ball is kicked across a field at an angle of  $30^\circ$  with an initial speed of 16 m/s. Write a set of parametric equations for the motion of the soccer ball.
  
  
  
  
  
  
  
  
  
  
- 2) A golf ball is struck across a flat fairway at an angle of  $45^\circ$  with an initial speed of 136 ft/s. Write a set of parametric equations for the motion of the golf ball.
  
  
  
  
  
  
  
  
  
  
- 3) A snowball is thrown at an angle of  $60^\circ$  with an initial speed of 45 ft/s and an initial height of 5 ft. Write a set of parametric equations for the motion of the snowball.
  
  
  
  
  
  
  
  
  
  
- 4) A cannon ball is fired across a flat field at an angle of  $45^\circ$  with an initial speed of 103 ft/s and an initial height of 31 ft.
  - i) Write a set of parametric equations for the motion of the cannon ball.
  - ii) Determine how long the cannon ball was in the air.
  - iii) Determine how far the cannon ball traveled in the air.
  - iv) Determine when the cannon ball reached its maximum height.
  - v) Determine the maximum height reached by the cannon ball.
  - vi) Sketch the graph of the parametric equations.



## Ideal Projectile Motion

Date \_\_\_\_\_ Period \_\_\_\_\_

- 1) A soccer ball is kicked across a field at an angle of  $30^\circ$  with an initial speed of 16 m/s. Write a set of parametric equations for the motion of the soccer ball.

$$x = 8t\sqrt{3}, \quad y = 8t - \frac{9.8t^2}{2}$$

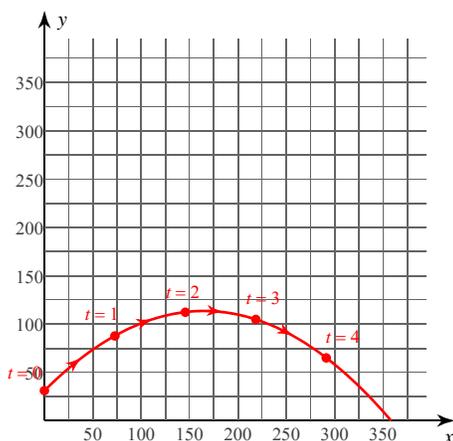
- 2) A golf ball is struck across a flat fairway at an angle of  $45^\circ$  with an initial speed of 136 ft/s. Write a set of parametric equations for the motion of the golf ball.

$$x = 68t\sqrt{2}, \quad y = 68t\sqrt{2} - \frac{32.17t^2}{2}$$

- 3) A snowball is thrown at an angle of  $60^\circ$  with an initial speed of 45 ft/s and an initial height of 5 ft. Write a set of parametric equations for the motion of the snowball.

$$x = \frac{45t}{2}, \quad y = 5 - \frac{32.17t^2}{2} + \frac{45t\sqrt{3}}{2}$$

- 4) A cannon ball is fired across a flat field at an angle of  $45^\circ$  with an initial speed of 103 ft/s and an initial height of 31 ft.
- Write a set of parametric equations for the motion of the cannon ball.
  - Determine how long the cannon ball was in the air.
  - Determine how far the cannon ball traveled in the air.
  - Determine when the cannon ball reached its maximum height.
  - Determine the maximum height reached by the cannon ball.
  - Sketch the graph of the parametric equations.



$$i) \quad x = \frac{103t\sqrt{2}}{2}, \quad y = 31 - \frac{32.17t^2}{2} + \frac{103t\sqrt{2}}{2}$$

$$ii) \quad 4.92 \text{ s}$$

$$iii) \quad 358.31 \text{ ft}$$

$$iv) \quad 2.26 \text{ s}$$

$$v) \quad 113.44 \text{ ft}$$