Upward Projectiles

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|  | A ball is kicked at 37° above the horizontal on level ground with a velocity of 20 m/s.  Is the ball moving in both the x and y direction equally?  Show some math to justify your answer above.  Find the max height of the ball above the ground.  How long will the ball be in the air before it lands?  How far will the ball go before it lands?  Is there another angle that the ball can be kicked at with a velocity of 20 m/s and still hit the same spot on the ground? Justify your answer with some math? |
| A ball is kicked with an initial velocity of 15 m/s at and an angle of 40˚ above the horizontal on flat level round in a stadium. | Determine the initial vertical and horizontal velocity of the ball.  Determine the length of time the ball will be in the air before it lands.  Determine how far the ball will travel before it lands. |
| A ball is kicked upward from the ground with an initial velocity of 25 m/s at an angle of 25˚ above the horizontal. | Determine the initial vertical and horizontal velocity of the ball.  Determine the length of time the ball will be in the air before it lands.  Determine how far the ball will travel before it lands. |
| Sketch a graph of the Vertical Velocity vs time for the ball in the problem above | Sketch a graph of the horizontal velocity vs time for the ball above |
|  | Now place the ball on a building that is 10.0 m above the ground. If the ball is kicked at 20 m/s at 37° above the horizon, how long will the ball be in the air before it lands? How far will it land from the base of the building where it launched? |