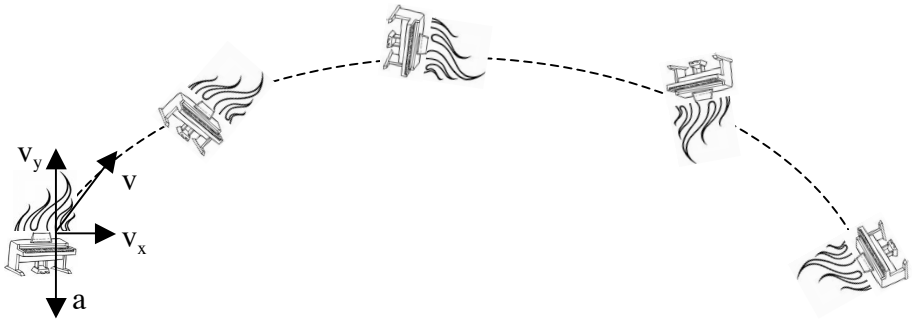
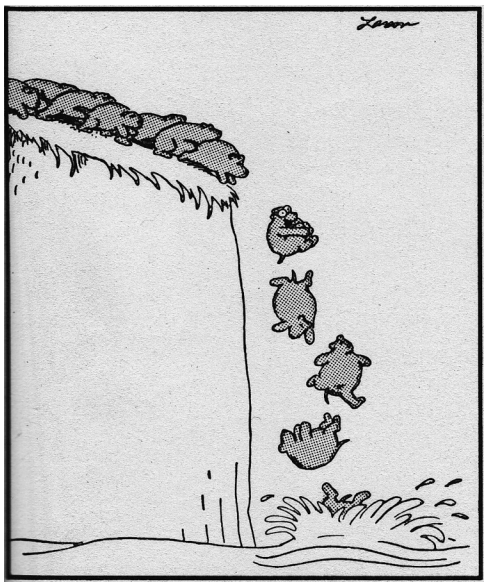
1. Check out this flaming piano launched with a trebuchet (http://www.youtube.com/watch?v=-wVADKznOhY). Below is a sketch of its flight. At each image of the piano add in the velocity vector, its horizontal and vertical components, and the acceleration vector. Be sure the lengths of the vectors are appropriate from image to image. Use the first image as a guide. Explain your thinking.



2. In the cartoon at the right, the next lemming to leave the cliff leaps in such a way that his initial velocity of 2.00m/s is perfectly horizontal. He will land 1.70m out from the base of the cliff. Find (a)the time he is in the air and (b)the height of the cliff.



3. A free throw is made by shooting the ball at 8.65m/s at 35.0° above horizontal from 1.83m above the ground. The basket is 4.21m away. Find (a)the time the ball is in the air and (b)the height of the basket. Refer to the sketch at the bottom right.

4. In a standard game of darts, the dartboard is hung so that the bullseye is 1.727m from the floor and the line behind which the player must stand is 2.369m from the board. Suppose a player throws a dart from the same height as the bullseye with a speed of 5.432m/s. Find the two launch angles that result in a bullseye.