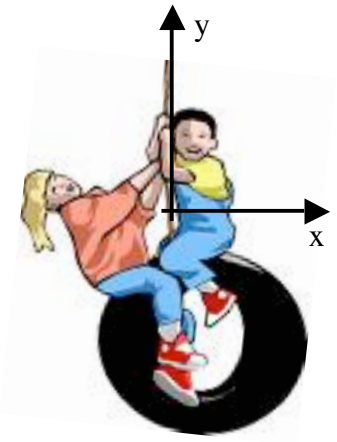
COMMENT ON PROBLEM SOLVING:

When you write up your solutions, you should have a document that is very helpful to you come exam time. A problem solution that is just some equations, a few lines of algebra, and a couple of numbers not help you study at all. When you study for an exam you want to fully understand the reasoning behind the solution and the best way to describe the reasoning is with words and pictures. You will always see me draw sketches and writing the words that explain what I am doing. I expect you to do the same thing. In summary, a proper problem solution includes:

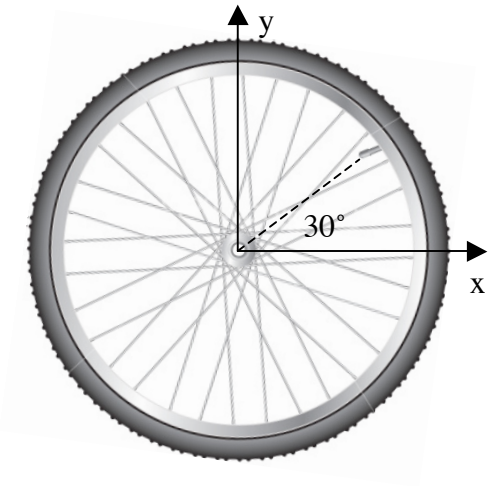
- A sketch of the important features of the problem.
- A clearly identified coordinate system, if needed.
- A list of known quantities.
- A list of the quantities you intend to find.
- The names of the relevant definitions, laws, and useful relationships you use.
- A written explanation of the reasoning required for the key steps.
- The algebra done first, then the numbers plugged in.
- A clear indication of the final answer (such as a box around it)
- A final written comment about the result.

1. For the orbit of Earth around the sun, find the (a)tangential speed, (b)angular frequency, and (c)centripetal acceleration.

2. Two children are moving back and forth on a 2.00m long tire swing as shown at the right. Their speed at the bottom is 3.00m/s. Find their (a)velocity and (b)acceleration vectors in terms of the coordinates shown.



3. The bicycle tire shown at the bottom left has a radius of 35.0cm and spins counter-clockwise at a rate of 10.0rad/s. Find the (a)tangential speed and (b)centripetal acceleration of the valve stem.



4. Assume that the valve stem was along the x-axis at t=0s. Find the (a)time, (b)position vector, (c)velocity vector, and (d)acceleration vector when the valve stem is 30° above the x-axis. Express the vectors in unit vector notation. (e)Sketch these vectors.