

The diagram below represents a wheel of an automobile moving to the right at a velocity v . Consider a point P on a tire and assume that it is directly on the bottom of the tire at $t = 0$. Neglect any compression of the tire and assume it is a perfect circle with a variable radius r .

- Write a program that will plot the position y of the point P as a function of the horizontal distance x for any given value of r . Attach a copy of your M-file.
- Run your program using radius r values of 10", 15", and 20".
- For each value of r in part (b) plot the variable y over two complete revolutions of the wheel. Provide appropriate labels and a title for the graphs. Attach a copy of each of the three plots.

HINT: Start by considering the x and y coordinates as separate functions of the rotational and translational motions and then combine the results. It is best to express the x and y positions of the point in parametric form as a function of the angle of rotation of the wheel measured from the initial position.

