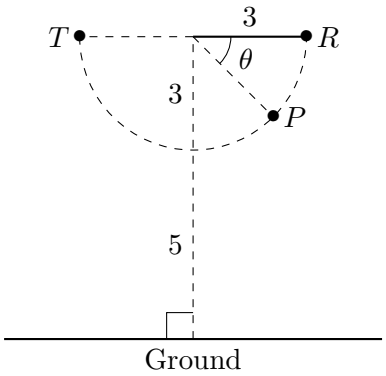
10. [9 points] A pendulum is swinging in a semi-circular arc of radius 3 feet pictured below. The pendulum starts at the point R and swings along the arc until it reaches the point T. Then, it swings back to the point R along the arc. The motion then repeats.

Assume that the line through the points T and R is parallel to the ground.



a. [4 points] Suppose $h(t)$ is the height of the pendulum above the ground t seconds after it is at the point R. Find the amplitude and midline of the graph of $y = h(t)$.

Amplitude: _____ Midline: _____

b. [2 points] The function $h(t)$ defined in part (a) has period 4. Find the period of the function $3h(5t)$.

Period of $3h(5t)$: _____

c. [3 points] The angle θ measures $\frac{3\pi}{10}$ radians. Find the height of the pendulum above the ground when it is at the point P. Give your answer in **exact** form.

Height of pendulum at P: _____

