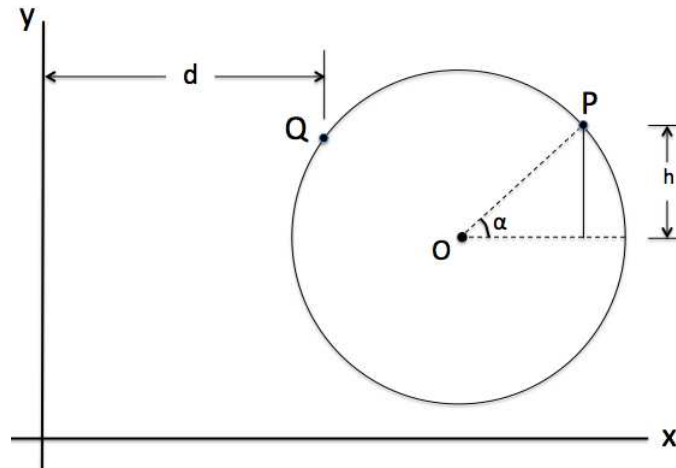


7. [10 points] Let C be a circle lying entirely in the first quadrant with radius 4 meters and center at the point $O = (a, b)$ (see the diagram below). A spider is standing at the point P on the circle. The point P makes an angle $\alpha = \frac{\pi}{4}$ radians (measured counterclockwise) with the horizontal line passing through the point O .



- a. [2 points] Find the length of the vertical distance h from the point P to the horizontal line passing through the center O of the circle.

$$h = \underline{\hspace{4cm}}$$

- b. [3 points] The spider walks 7 meters around the circle, in the counterclockwise direction, from the point P until it reaches the point Q . Find the measure of the angle POQ (in radians).

$$\text{Angle } POQ = \underline{\hspace{4cm}}$$

- c. [5 points] Find the horizontal distance d , in meters, between the point Q and the y -axis. Your answer must be in **exact form** and may contain the constants a and/or b .

$$d = \underline{\hspace{4cm}}$$