

# Math 124-Quiz#1 (20 points-20minutes)

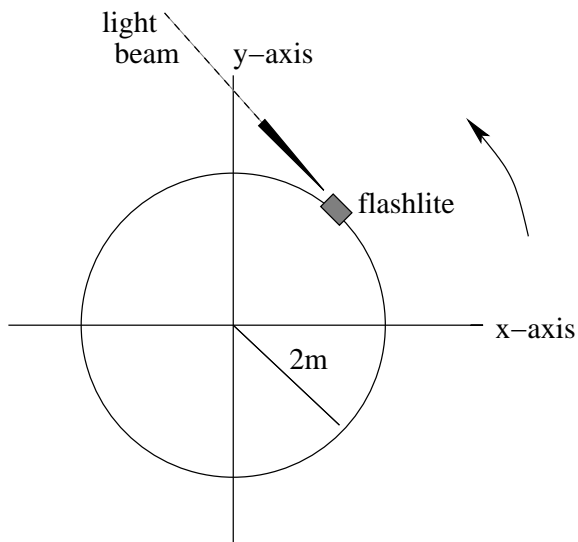
Name:

TA/section:

Instructions: You must show your work for credit. No notes allowed. A scientific calculator is allowed. No graphing calculators.

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A flashlight is attached to the edge of a rotating wheel of radius 2 meters. The wheel rotates counterclockwise. Assume that the light beam of the flashlight always points in a direction tangential to the circle. Here is a picture of the situation, from above, with a coordinate system imposed.



1. (7pts) If the flashlight is at the position  $Q = (1, -\sqrt{3})$ , where does the light beam cross the  $x$ -axis.

(more on back)

2. (9pts) If the light beam crosses the  $x$ -axis at the point  $(3, 0)$ , what is the position (i.e. the coordinates) of the flashlight on the wheel? Give an exact answer, not a decimal approximation.

3. (4pts) Assume the flashlight begins at the position  $(2, 0)$  and is rotating  $\frac{\pi}{5}$  rad/sec counterclockwise. During the first 10 seconds, when does the light beam cross the positive  $x$ -axis?