

Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals

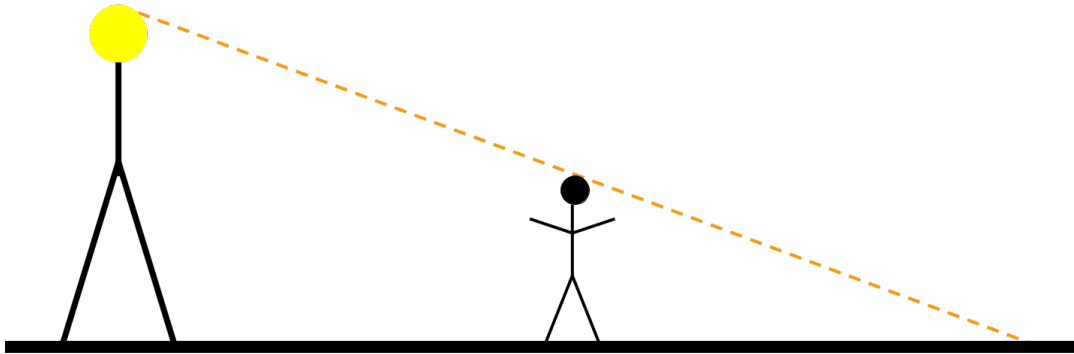
TRENT UNIVERSITY, Summer 2025 (S62)

Quiz #7 – Related Rates Redux

*Due on Tuesday, 15 July.**

On the Island of Light and Shadow all artificial sources of illumination are robotic and mobile, but only come out of hiding when needed. Stickon, a 2 m tall newly-arrived visitor to the island encounters a 4 m tall street lamp at night. It approaches to perform its function. Stickon, perceiving a creature with a glowing head coming on, panics, turns, and runs away along the level road they are on. Stickon sprints away at 6 m/s and the street lamp pursues at 12 m/s .

Consider the shadow cast by Stickon onto the road in the light of of the street lamp.



At the instant that the street lamp is 15 m behind Stickon, ...

1. ... how is the length of the shadow changing? $[4]$
2. ... how quickly is the tip of the shadow moving? $[1]$

Numbers

A number will find
fulfillment enough
in knowing its mind
and doing its stuff.

Another grook by Piet Hein.

* You should submit your solutions via Blackboard's Assignments module, preferably as a single pdf. If submission via Blackboard fails, please submit your work to your instructor by email or on paper. You may work together and look things up, so long as you write up your submission by yourself and give due credit to your collaborators and any sources you actually used.