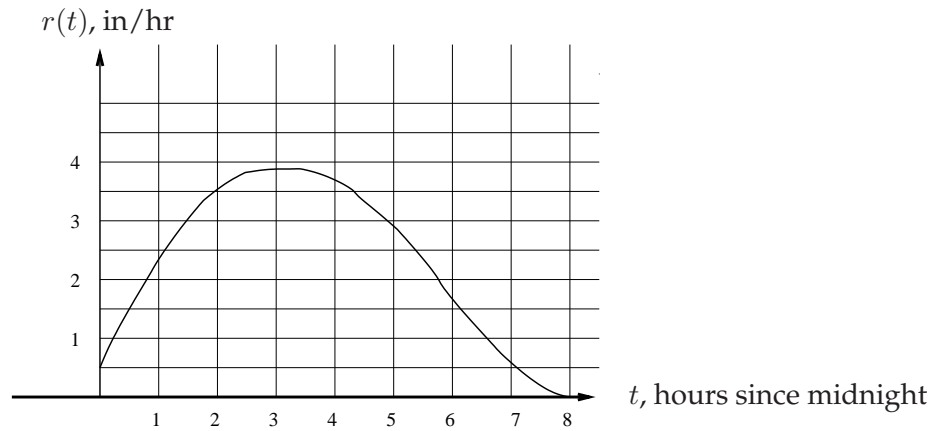


7. (16 points) One winter a huge storm hit the Ann Arbor area hours earlier than expected. Snow began falling at midnight and quickly began to accumulate. Although emergency conditions were put into place immediately, snow removal teams were unable to get onto the roads until 2:00 a.m. Particular attention was given along I-94, which needed to be cleared for heavy commuter traffic. The rate of snowfall along that highway strip is given by the graph below, where  $r(t)$  is in inches per hour, and  $t$  is hours past midnight. Assume that once the removal starts, plows can remove the snow at an average rate of 2 in/hour. Use the graph to find or to estimate the following:



- (a) The amount of snowfall that had accumulated prior to the time the plows got on the road at 2:00 a.m.
- (b) The rate at which the snow level is changing at 3:00 a.m.
- (c) The time when the level of accumulated snow is maximum.
- (d) The time when the highway was cleared of snow, assuming that the snowfall stopped at 8:00 a.m.