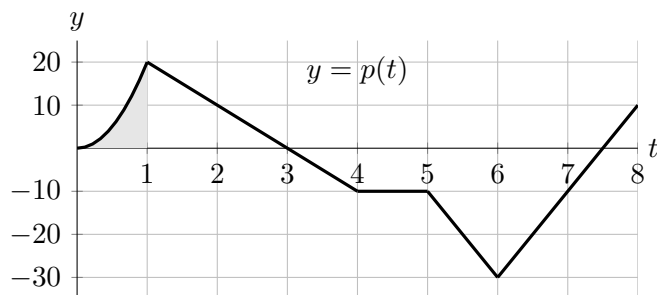


5. [10 points] This problem uses the same setup as the previous problem. Recall that the rate at which the total volume of toxin in the lake changes, in gallons per day, is given by $p(t)$, where t is measured in days after midnight on October 10. The graph of $p(t)$ is shown below.



Recall that the area of the shaded region is 7, and that on October 15 at midnight, Derivative Girl realized there were still 50 gallons of toxin in the lake.

Let $P(t)$ be the total number of gallons of toxin in the lake t days after October 10 at midnight. Carefully sketch the graph of $P(t)$ below. Make sure the following features of the function $P(t)$ are displayed clearly in your sketch:

- the value of P at $t = 0, 1, 2, \dots, 8$.
- where $P(t)$ is and is not differentiable;
- where $P(t)$ is increasing, decreasing, or constant;
- the concavity of $P(t)$.

