**9.** [8 points]  The *Lambda* app, developed by your friends, displays information about a train that departed the Detroit station at noon and is traveling on the track between Detroit and Ann Arbor.

The app shows you several values of $\lambda(t)$, the differentiable function that gives the distance along the track, in kilometers, from the Detroit station to the train $t$ minutes after noon:

| $t$ | 37 | 39 | 41 | 43 | 45 |
|---|---|---|---|---|---|
| $\lambda(t)$ | 16 | 16 | 24 | 30 | 36 |

The graph of $\lambda'(t)$, the <u>derivative</u> of $\lambda(t)$, for $0 \leqslant t \leqslant 37$, is also shown:
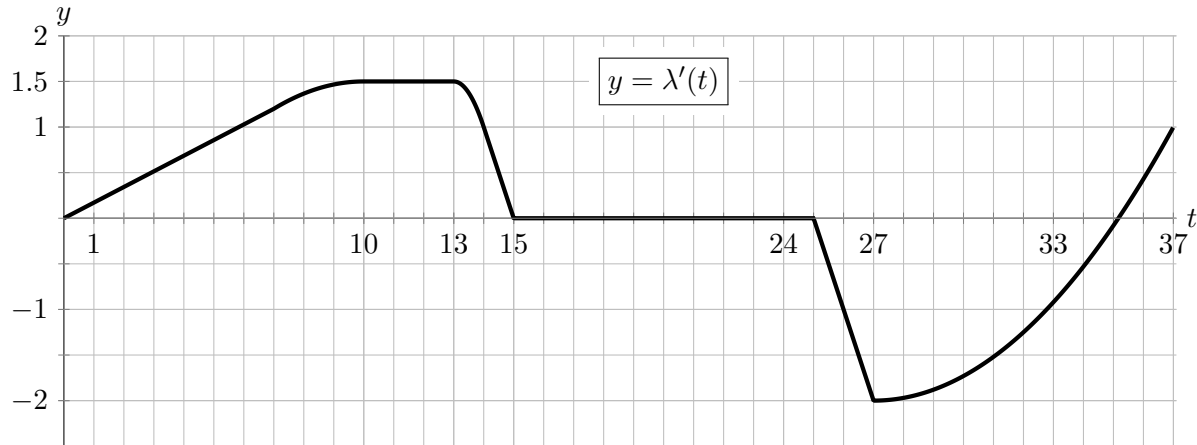


For parts **a.** and **b.**, you may estimate values from the graph as needed.

**a.** [1 point] Find all times $t$ for $0 < t < 37$ when the train is traveling at its maximum *velocity*. Give your answer as value(s) and/or interval(s) of $t$.

**Answer:** _____

**b.** [1 point] Find all times $t$ for $0 < t < 37$ when the train is traveling at its maximum *speed*. Give your answer as value(s) and/or interval(s) of $t$.

**Answer:** _____

**c.** [2 points] Find the average velocity of the train between 12:00pm and 12:45pm. Include units.

**Answer:** _____

**d.** [2 points] Estimate the instantaneous velocity of the train at $t = 41$. Include units.

**Answer:** _____

**e.** [2 points] During which of the following time intervals is the train stopped for the entire time? Circle <u>all</u> correct choices.

$(3,5)$        $(10,13)$        $(18,21)$        $(41,45)$        NONE OF THESE