## Driving Rationally - Extend

Name: Date: $\qquad$

We have found that, in order to average 50 miles per hour, the speed Antonia must drive on the second half of her 200-mile trip can be modeled by $y=\frac{25 x}{x-25}$, where x is her average speed for the first 100 miles, and y is her average speed on the last 100 miles.

Answer the following questions using complete sentences.

1. What is the minimum speed at which Antonia must drive the first 100 miles to average 50 miles per hour for the entire trip?
2. Why can she not drive at a slower rate of speed?
3. How does the function we wrote reflect the minimum speed you found?
4. What would happen if you tried to plug the minimum speed into this function?
5. Complete the following table of values for our function, $y=\frac{25 x}{x-25}$.

| x | 30 | 29 | 28 | 26 | 25.7 | 25.4 | 25.2 | 25.1 | 25.01 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| y |  |  |  |  |  |  |  |  |  |

6. What happens to the value of $y$ as $x$ gets closer to 25 ? Why does this make sense in the context of the problem?
