THE TORTOISE AND THE HARE

THE SCENARIO

The Tortoise and the Hare finally have their long awaited rematch. The Tortoise gets a 1,000 foot lead and runs at 9 inches per second. The Hare begins at the starting line and runs at a rate of 6 feet per second. There is also a rat in this race. The Rat starts 1,200 feet ahead of the Hare and runs back towards the starting line at a rate of 2 feet per second.

THE ASSIGNMENT

Write a story about the race. The story should contain the following events and information in chronological order:

1. When will the Tortoise and Hare pass each other and how far will they be from the starting line?
2. When will the Tortoise and Rat pass each other and how far will they be from the starting line?
3. When will the Rat and Hare pass each other and how far will they be from the starting line?
4. After one minute into the race, how far will each runner be?
5. When will the rat cross the starting line?
6. If the race is a quarter-mile long, who will win and what will be the margin of victory (both time and distance)?

Accompanying your story will be the following:

I. Equations for each of the runners, relating time t to distance from the starting line d.
II. A graph of all three equations on the same coordinate plane, with a domain of $0 \leq t \leq 650$ seconds, and a range of $0 \leq d \leq 1500$ feet. Be sure the graph shows all significant data points.
III. An equation and graph for both the one-minute mark and the finish line.

THE CALCULATIONS

Attach your story and graph. Make sure the story is in chronological order.

Write equations for each of the runners, relating time t to distance from the starting line d. Also, include an equation for both the one minute mark and the finish line.

Tortoise: _____

Hare: _____

Rat: _____

One Minute Mark: _____

Finish Line: _____

1. When will the Tortoise and Hare pass each other and how far will they be from the starting line?

Time: _____ seconds

Distance From Start: _____ feet

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2. When will the Tortoise and Rat pass each other and how far will they be from the starting line?

Time: _____ seconds

Distance From Start: _____ feet

3. When will the Rat and Hare pass each other and how far will they be from the starting line?

Time: _____ seconds

Distance From Start: _____ feet

4. After one minute into the race, how far will each runner be?

Tortoise: _____ feet

Hare: _____ feet

Rat: _____ feet

5. When will the rat cross the starting line?

Time: _____ seconds

6. If the race is a quarter-mile long, who will win, and what will be the margin of victory (both time and distance)?

Winner: _____

Margin of Victory: _____ seconds

_____ feet