In a motorcycle race, three riders crossed the finish line at exactly the same time, one hour after the race started. Their distances traveled at time *x* for one hour could be modeled approximately by the three functions below from the time they started until the race finished 1 hour later:

Rider A: 

Rider B: 

Rider C: 

Unfortunately, there was only one trophy, so organizers tried to decide who should receive the trophy by considering another aspect of the ride.

One organizer argued that whoever maintained the lead the most time should win the trophy. Another organizer argued that whoever achieved the fastest speed over any period of time during the race should win the trophy. Who would win the trophy in each of these cases? Be ready with a mathematical argument.

Although it is unlikely, suppose the rides could continue to be modeled by the equations above. Who would win at the end of 2 hours? At the end of 4 hours? After that?



There was another rider, Rider D, who came very close to winning. In fact, she started the race faster than any of the three winners and increased her speed slowly, then at about half an hour, her bike broke down, and she was stopped long enough for all the three winners to pass her. She started her motorcycle again and was able to speed up enough to come in just a second after the three winners. Sketch a possible graph for Rider D’s ride.