■SCHOLASTIC

THE HARDEST MATH PROBLEM STUDENT CONTEST

"One more day!" Sonia thought, stretching after a run. Her smartwatch had shown she'd steadily improved in her triathlon training. (A triathlon is like a marathon with three parts: swimming, biking, and running.)

The sprint triathlon in which she is competing consists of a 750-meter swim, a 20-kilometer bike, and a 5-kilometer run. In her most recent training, Sonia finished the swim in 13 minutes and 45 seconds, the bike ride in 45 minutes, and the run in 19 minutes, each at its own consistent speed.

The next morning, Sonia arrived at the triathlon to find the organizers in a bit of a disarray. "What's going on?!" Baby ducklings were invading the first part of the course. To avoid these cute but ferocious creatures, the organizers set a new starting point farther along the shore, but now the swim consisted of only 425 meters.

GRADE 6

"Hmm...actually this duckling detour is awesome," Sonia thought. She wondered how the change would affect her overall triathlon time. After finishing both her swim and bike ride at her training rate for each, she was amazed to see her overall time. Maybe those ducklings were enough help that she could complete the race at her dream time—if she could manage to speed up her run. **With the duckling detour, she would need to finish her run in _____% of the time of her training run in order to finish the entire race in exactly 70 minutes.** (Give the answer that correctly fills in the blank, rounding to the nearest tenth of a percent.)

GRADE 7

While Sonia dove right into the water after hearing about the duckling detour, her best friend Stephen was very confused and went to get his questions answered by the organizers. He finally jumped into the water 7 minutes and 23 seconds after Sonia. Stephen's training swim time had been 16 min and 15 seconds, his training bike time had taken 40 minutes, and his training run time was 15 minutes. In training, Stephen had always fallen behind Sonia during their swim and caught back up later in the race. **How many meters into the competition will it take before Stephen catches up to Sonia, assuming they both maintain their training times exactly?**

GRADE 8

Sonia's family cheered for her from the side, except for her younger brother, who cheered wildly for the ducklings. Sonia's brother noticed that when the last competitor jumped in, there were five times as many swimmers as ducklings in the lake (no competitors had finished yet). When Sonia finished swimming, she was the 126th person to leave the water (it was a long race to watch, and his phone had died, so all he could do was count...). There were now twice as many ducklings as swimmers, although the number of ducklings in the lake had not changed during the triathlon. **How many swimmers were in the lake when that last competitor jumped in?**

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