

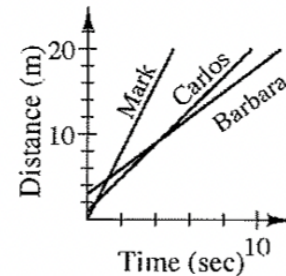
THE BIG RACE – HEAT 3

Barbara, Mark, and Carlos participated in the third heat of “The Big Race.” Barbara thought she could win with a 3 meter head start even though she only pedaled 3 meters every 2 seconds. Mark began at the starting line and finished the 20 meter race in 5 seconds. Meanwhile, Carlos rode his tricycle so that his distance (y) from the starting line in meters could be represented by the equation $y = \frac{5}{2}x + 1$, where x represents time in seconds.



a. What is the dependent variable? What is the independent variable? [**The dependent variable is distance in meters and the independent variable is time in seconds.**]

b. Using the given information, graph lines for Barbara, Mark, and Carlos on the same set of axes. Who won the 20 meter race and will advance to the final race? [**See graph at right. Mark won the race, finishing in 5 seconds.**]



c. Find equations that describe Barbara’s and Mark’s motion. [**Barbara: $y = \frac{3}{2}x + 3$, Mark: $y = 4x$**]

d. How fast did Carlos pedal? Write your answer as a unit rate. [**5 meters every 2 seconds, or $\frac{5}{2}$ meters per second.**]

e. When did Carlos pass Barbara? Confirm your answer algebraically. [**2 seconds after the start of the race, when each is 6 meters from the starting line.**]