Progress Reports are going out today.
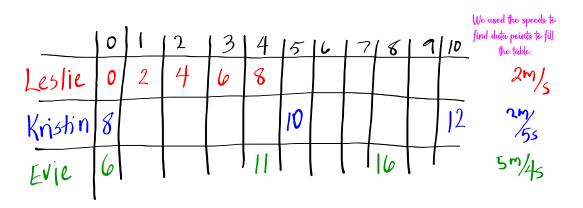
Please get them signed.

The Big Race Heats 1 and 2 Recap:

THE BIG RACE – HEAT 1

Before a big race, participants often compete in heats, which are preliminary races that determine who competes in the final race. Later in this chapter, your class will compete in a tricycle race against the winners of these preliminary heats.

In the first heat, Leslie, Kristin, and Evie rode tricycles toward the finish line. Leslie began at the starting line and rode at a constant rate of 2 meters every second. Kristin got an 8-meter head start and rode 2 meters every 5 seconds. Evie rode 5 meters every 4 seconds and got a 6-meter head start.
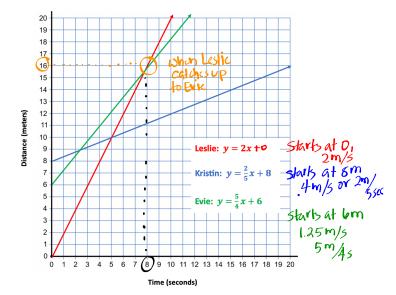
We used the speeds to find data points to fill the table.

	0	1	2	3	4	5	6	7	8	9	10	
Leslie	0	2	4	6	8							$2m/s$
Kristin	8					10					12	$\frac{2m}{5s}$
Evie	6			11				16				$5m/4s$

Can we write equations? $y = mx + b$

Leslie: $y = 2x$

Kristin: $y = \frac{2}{5}x + 8$ ← starting point

↑ speed

Evie: $y = \frac{5}{4}x + 6$

The Big Race – Heat 1

Leslie: $y = 2x + 0$ — Starts at 0, 2m/s

Kristin: $y = \frac{2}{5}x + 8$ — starts at 8m .4m/s or 2m/5sec

Evie: $y = \frac{5}{4}x + 6$ — starts at 6m 1.25m/s 5m/4s

when Leslie catches up to Evie

b. After how many seconds did Leslie catch up to Evie? How far were they from the starting line when Leslie caught up to Evie? Confirm your answer algebraically and explain how to use your graph to justify your answer.

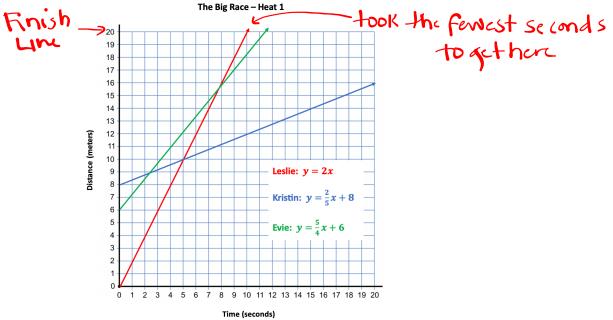Looked for where the lines of Leslie and Evie intersect.

16 meters from the starting line

When is Leslie's distance = to Evie's distance?

$y = 2x$ $y = \frac{5}{4}x + 6$

If they have gone the same distance, the y values are the same.

This is what is meant by confirming an answer algebraically.

$$4\left[2x = \frac{5}{4}x + 6\right]$$

$$8x = 5x + 24$$
$$\underline{-5x \quad -5x}$$
$$\frac{3x}{3} = \frac{24}{3}$$
$$x = 8$$

It took 8 sec for them to cross paths.

We see this on the graph too!

The Big Race – Heat 1

Finish Line →

took the fewest seconds to get here

Distance (meters)

Leslie: $y = 2x$

Kristin: $y = \frac{2}{5}x + 8$

Evie: $y = \frac{5}{4}x + 6$

Time (seconds)

c. The winner of this heat will race in the final Big Race. If the race is 20 meters long, who won? Use both the graph and the equations to justify your answer.

Leslie wins!   approx. 10 sec

Is this valid?

Let's make $y = 20$

$y = 2x$

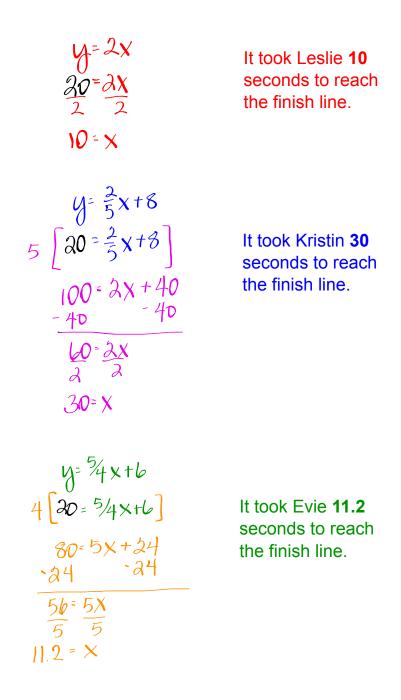$\dfrac{20}{2} = \dfrac{2x}{2}$

$10 = x$

Yes! This agrees with the graph that it took Leslie 10 seconds to reach the finish line 20 meters away.

d. How long did it take each participant to finish the race?

Leslie: $y = 2x$

Kristin: $y = \frac{2}{5}x + 8$

Evie: $y = \frac{5}{4}x + 6$

Let's make $y = 20$

Because the finish line is 20 meters away.

Let's solve for x to find out how many seconds it took each of them to reach the finish line.

$$y = 2x$$
$$\frac{20}{2} = \frac{2x}{2}$$
$$10 = x$$

It took Leslie **10** seconds to reach the finish line.

$$y = \frac{2}{5}x + 8$$
$$5\left[20 = \frac{2}{5}x + 8\right]$$
$$100 = 2x + 40$$
$$-40 \qquad -40$$
$$\frac{60}{2} = \frac{2x}{2}$$
$$30 = x$$

It took Kristin **30** seconds to reach the finish line.

$$y = \frac{5}{4}x + 6$$
$$4\left[20 = \frac{5}{4}x + 6\right]$$
$$80 = 5x + 24$$
$$-24 \qquad -24$$
$$\frac{56}{5} = \frac{5x}{5}$$
$$11.2 = x$$

It took Evie **11.2** seconds to reach the finish line.

e. The school newspaper wants to report Kristin's speed. How fast was Kristin riding? Write your answer as a unit rate.

$$y = \frac{2}{5}x + 8$$

Kristin rode 2 meters every 5 seconds.

$$\frac{2 \text{ meters}}{5 \text{ seconds}} = 0.4 \text{ meters per second}$$

THE BIG RACE – HEAT 2

In the second heat, Elizabeth, Kaye, and Hannah raced down the track. They knew the winner would compete against the other heat winners in the final race.

a. When the line representing Kaye's race is graphed, the equation is $f(y) = \frac{2}{3}x + 1$. What was her speed (in meters per second)? Did she get a head start?

b. Elizabeth's race is given by the equation $f(y) = \frac{12}{16}x + 4$. Who is riding faster, Elizabeth or Kaye? How do you know?

c. Just as she started pedaling, Hannah's shoelace came untied! Being careful not to get her shoelace tangled in the pedal, she rode slowly. Hannah's race is represented by the table to the right. At what unit rate was she riding? Write your answer as a unit rate.

Hannah's Race	
Time (sec)	Distance (meters)
14	10
28	14
42	18

d. To entertain the crowd, a clown rode a tricycle in the race described by the equation $f(y) = 20 - x$. Without graphing or making a table, fully describe the clown's ride.

$$y = 20 - x$$

$$y = -x + 2$$

Homework

Finish classwork