

# Lesson 15: Equations of Graphs of Proportional Relationships

## Involving Fractions

### Classwork

#### Example 1: Mother's 10K Race

Sam's mother has entered a 10K race. Sam and his family want to show their support of their mother, but they need to figure out where they should go along the race course. They also need to determine how long it will take her to run the race so that they will know when to meet her at the finish line. Previously, his mother ran a 5K race with a time of  $1\frac{1}{2}$  hours. Assume Sam's mother ran the same rate as the previous race in order to complete the race.

Create a table that will show how far Sam's mother has run after each half hour from the start of the race, and graph it on the coordinate plane to the right.

$$k = \frac{y}{x}$$

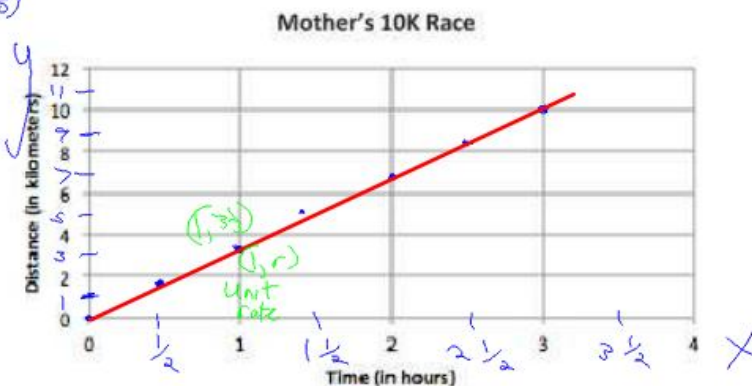
$$k = \frac{5 \text{ km}}{1\frac{1}{2} \text{ h}}$$

$$= \frac{5}{1\frac{1}{2}}$$

$$= 3\frac{1}{3} \text{ km/h}$$

$D = 3\frac{1}{3}(h)$        $3\frac{1}{3}(2\frac{2}{3})$

Time (H, in hours)	Distance Run (D, in km)
$\frac{1}{2}$	$1\frac{2}{3}$
1	$3\frac{1}{3}$
$1\frac{1}{2}$	5
2	$6\frac{2}{3}$
$2\frac{1}{2}$	$8\frac{1}{3}$
3	10



- What are some specific things you notice about this graph?  
Distance run and time are proportional b/c the points form a line that goes through the origin.
- What is the connection between the table and the graph?  
All of the pairs of #'s in the chart are plotted on the graph. Time is on the x-axis & Distance is on the y-axis.
- What does the ordered pair  $(2, 6\frac{2}{3})$  represent in the context of this problem?  
In 2 hrs, Sam's mother can run  $6\frac{2}{3}$  km.

$$D = 3\frac{1}{3}(h)$$