

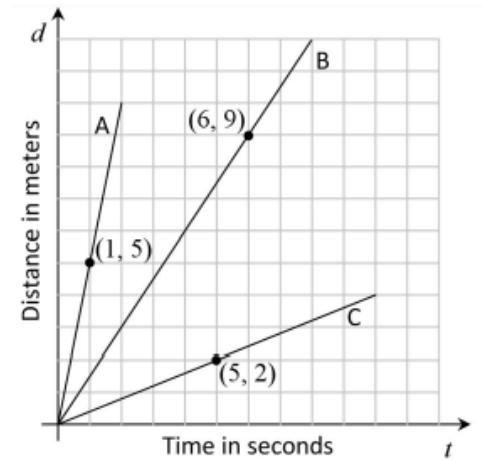
Compute the unit rate for each.

- 1) Jeff Gordon and Kyle Busch were driving practice laps at the Indy 500. The track is 2.5 miles around.
- Jeff drove 4 laps in 3 minutes.
 - Kyle drove 6 laps in 5 minutes.
- a. How many minutes does it take Jeff to drive 1 mile?
- b. How many minutes does it take for Kyle to drive 1 mile?
- c. How far does Jeff drive in one minute?
- d. How far does Kyle drive in one minute?
- e. Who is driving faster? Explain your reasoning.
- 2) An airplane travels 780 miles in 4 hours, at a constant rate. Make a table to show the mileage for 2, 8, and 12 hours. Identify the constant of proportionality from the table and record your process.
- 3) Is there a direct variation in this table? If so, identify the constant of proportionality. If not, explain why there is no direct variation.

Hours	3	4	5	6
Wages	24	30	38	46

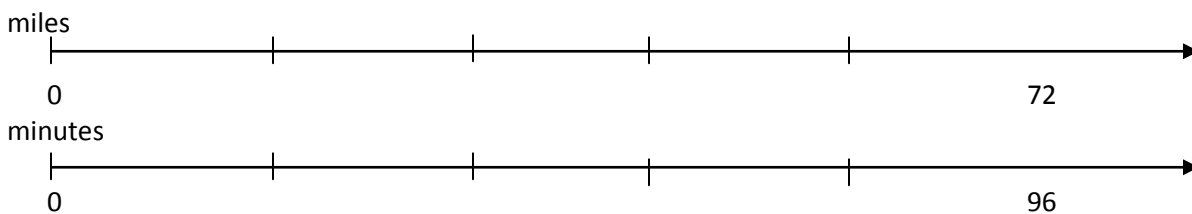
4) Carli's class built some solar-powered robots. They raced the robots in the parking lot of the school. The graphs are all line segments that show the distance, in meters, that each of three robots traveled after seconds.

- Each graph has a point labeled. What does the point tell you about how far that robot has traveled?
- Carli said that the ratio between the number of seconds each robot travels and the number of meters it has traveled is constant. Is she correct? Explain.
- How fast is each robot traveling? How did you compute this from the graph?



5) Felicity runs each day. She runs one trail that is $1\frac{1}{2}$ miles in $\frac{1}{4}$ hour. On another trail she runs $2\frac{3}{4}$ miles in $\frac{1}{2}$ of an hour. On which trail is Felicity faster? Show why.

6) Interpret the unit rate from the following diagram and justify your answer:



7) Delia and Vince mixed paint to make just the right color blue for their kitchen. Delia mixed $1\frac{1}{2}$ gallons of white with $\frac{3}{4}$ of a gallon of blue. Vince mixed $\frac{1}{2}$ gallon of blue for each gallon of white. Delia thought they would not have the same color, but Vince was sure it would be the same.

a) Which equation would show why the mixtures resulted in the same color? Justify your answer

$$\begin{aligned}b &= 2w \\w &= \frac{1}{2}b \\w &= 2b \\1\frac{1}{2}w &= \frac{3}{4}b\end{aligned}$$

b) What is the unit rate of white to blue in their mixture?

Compute the unit rate for each.

1) Jeff Gordon and Kyle Busch were driving practice laps at the Indy 500. The track is 2.5 miles around.

- Jeff drove 4 laps in 3 minutes.
- Kyle drove 6 laps in 5 minutes.

a. How many minutes does it take Jeff to drive 1 mile?

$$3 \text{ min}/10 \text{ mi} = .3 \text{ min}/1 \text{ mile}$$

b. How many minutes does it take for Kyle to drive 1 mile?

$$5 \text{ min}/15 \text{ mi} = .\bar{3} \text{ min}/1 \text{ mile}$$

c. How far does Jeff drive in one minute?

$$10 \text{ mi} / 3 \text{ min} = 3.3/\text{min}$$

d. How far does Kyle drive in one minute?

$$15 \text{ min}/5 \text{ min} = 3 \text{ miles}/1 \text{ min}$$

e. Who is driving faster? Explain your reasoning.

Jeff is faster because he's driving $3.\bar{3}$ mi/ min and Kyle is only driving 3 miles/min.

2) An airplane travels 780 miles in 4 hours, at a constant rate. Make a table to show the mileage for 2, 8, and 12 hours. Identify the constant of proportionality from the table and record your process.

Hours	2	4	8	12
Miles	390	780	1560	2340

Constant = 195 because hours x 195 = miles

3) Is there a direct variation in this table? If so, identify the constant of proportionality. If not, explain why there is no direct variation.

Hours	3	4	5	6
Wages	24	30	38	46

$$\frac{24}{3} = \$8 \text{ hour}$$

$$\frac{30}{4} = \$7.5 \text{ hour}$$

$$\frac{38}{5} = \$7.6 \text{ hour}$$

$$\frac{46}{6} = \$7.67 \text{ hour}$$

No. There are different unit rates for the hours worked.

4) Carli's class built some solar-powered robots. They raced the robots in the parking lot of the school. The graphs are all line segments that show the distance, in meters, that each of three robots traveled after seconds.

a. Each graph has a point labeled. What does the point tell you about how far that robot has traveled?

The y-value tells the distance the robot travels in meters and the x-value tells the time it took, in seconds, to travel that distance.

b. Carli said that the ratio between the number of seconds each robot travels and the number of meters it has traveled is constant. Is she correct? Explain.

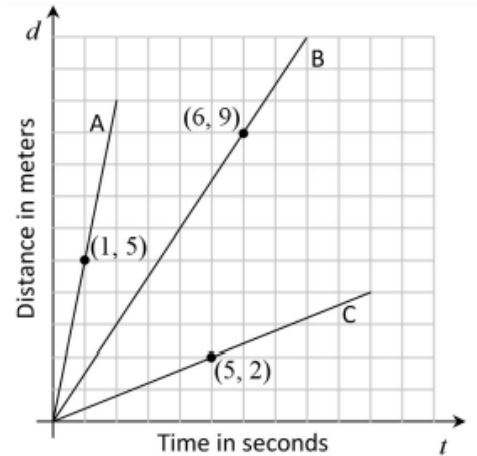
Each robot has a constant of proportionality (the ratio) which is the slope of a line.

c. How fast is each robot traveling? How did you compute this from the graph?

Robot A: 5 m/s

B: $\frac{3}{2} \text{ m/s}$

C: $\frac{2}{5} \text{ m/s}$

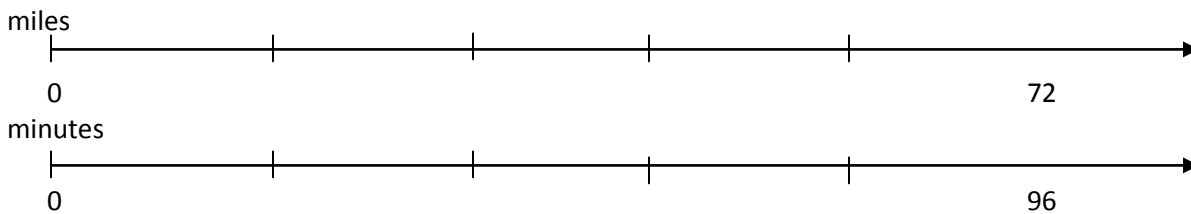


5) Felicity runs each day. She runs one trail that is $1\frac{1}{2}$ miles in $\frac{1}{4}$ hour. On another trail she runs $2\frac{3}{4}$ miles in $\frac{1}{2}$ of an hour. On which trail is Felicity faster? Show why.

$$\frac{1\frac{1}{2} \text{ miles}}{\frac{1}{4} \text{ hour}} = 6 \text{ miles per hour} \leftarrow \text{Faster}$$

$$\frac{2\frac{3}{4} \text{ miles}}{\frac{1}{2} \text{ hour}} = 5\frac{1}{2} \text{ miles per hour}$$

6) Interpret the unit rate from the following diagram and justify your answer:



$$\frac{72/96 \text{ miles}}{\text{min}} = \frac{3}{4} \text{ miles per min or } .75 \text{ miles per min}$$

7) Delia and Vince mixed paint to make just the right color blue for their kitchen. Delia mixed $1\frac{1}{2}$ gallons of white with $\frac{3}{4}$ of a gallon of blue. Vince mixed $\frac{1}{2}$ gallon of blue for each gallon of white. Delia thought they would not have the same color, but Vince was sure it would be the same.

a) Which equation would show why the mixtures resulted in the same color? Justify your answer

$$\begin{array}{l} b = 2w \\ w = 1/2b \\ w = 2b \\ 1\frac{1}{2}w = 3/4b \end{array} \quad \text{Both}$$

b) What is the unit rate of white to blue in their mixture?

2 gallons white/ 1 gallon blue