

6.0 Remember This?

Rates and Proportional Reasoning

A unit rate is how much for 1 thing

Example: $156.9^c/L$ 60 km/h points/game pay/hr

To set up a proportion make sure that units match!

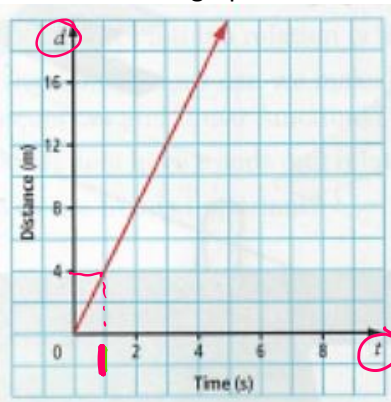
Example: A car needs 9.4 L of gasoline to go 120 km. How much will it need to travel 730 km?

$$\frac{9.4\text{ L}}{120\text{ km}} = \frac{x}{730\text{ km}}$$

$$x = 57.18\text{ L}$$

Linear Relationships

A distance time graph ...



1. At what rate is the distance increasing over time? Explain.

4 s \times check how much for 1
 4 m/s

2. What can you say about the distance and time where the graph crosses the t-axis and the d-axis?

at 0 secs, you've travelled 0m

shoes	\$
0	50
1	52
2	54
3	56
4	58
5	60

output = input (multiplier) + whatever makes it work

Taylor works at a shoe store. She makes \$50 per day plus \$2 for every pair of shoes she sells.

a. Create a table of values to show how much she would earn for selling up to five pairs of shoes in one day.

b. Develop an equation to model this situation.

$$m = 2s + 50$$

c. How much money will Taylor make in a day if she sells 23 pairs of shoes?

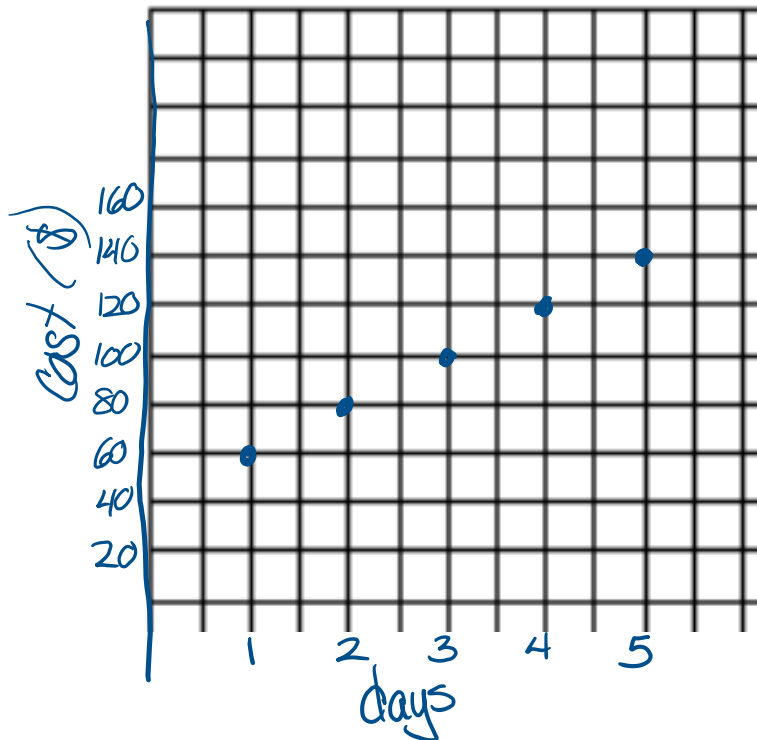
$$m = 2(23) + 50$$

$$= \$96$$

The cost of renting a snowboard can be calculated using the equation $C = 40 + 20d$, where C is the rental cost, in dollars, and d is the number of rental days.

- a. Graph the linear relation for the first five days.

Cost of Snowboard Rental



d	C
1	60
2	80
3	100
4	120
5	140

- b. From the graph, what is the approximate cost of renting the snowboard for one day? Seven days?

1 day - \$60
7 days - \$180

- c. If buying a used snowboard costs \$300, use your graph to approximate how many days you could rent a board before it becomes cheaper to buy it.

$$C = 40 + 20d$$

$$300 = 40 + 20d$$

$$\begin{array}{r} -40 \\ -40 \end{array}$$

$$260 = 20d$$

$$\frac{260}{20} = \frac{20d}{20}$$

$$d = 13 \text{ days}$$

Solve and Check:

a. $\frac{x}{1.3} - 5.8 = -2.4$

$$\begin{array}{r} 5.8 \quad 5.8 \\ 1.3 \left(\frac{x}{1.3} \right) = (3.4) 1.3 \\ x = 4.42 \end{array}$$

b. $\left(\frac{3}{2} \right) = \left(\frac{x+2}{-2} \right)^2$

$$\frac{3}{2} = \frac{x+2}{-2}$$

$$\frac{3}{2} - \frac{2}{1} = x$$

$$\frac{3}{2} - \frac{4}{2} = x$$

$$-\frac{1}{2} = x$$

c. $\left(\frac{1}{3}x + \frac{1}{2} \right) = \frac{5}{6}x$

$$2x + 3 = 5x$$

$$\begin{array}{r} -2x \\ -2x \end{array}$$

$$\frac{3}{3} = \frac{3x}{3}$$

$$1 = x$$