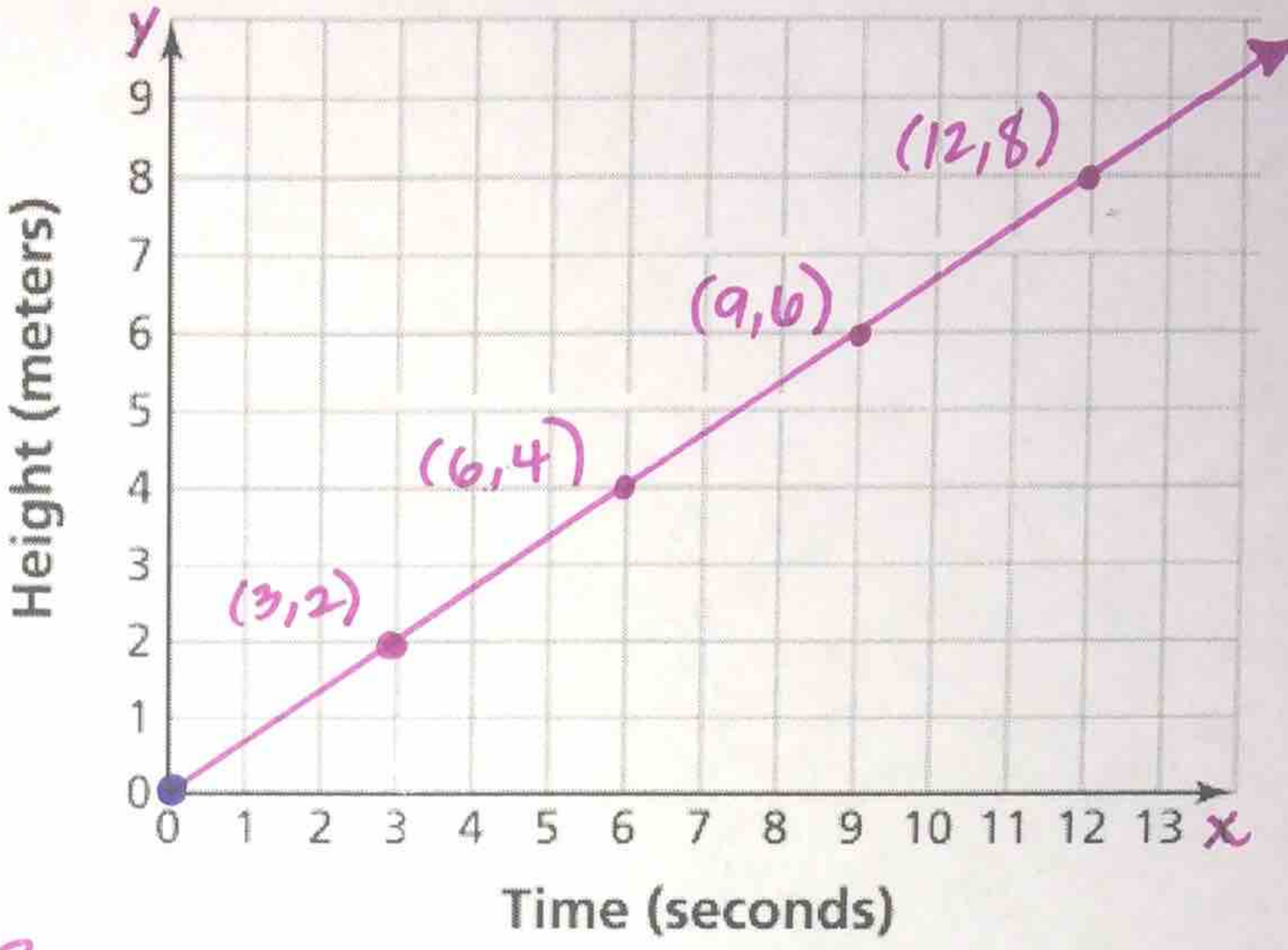
5.2 Graphing Proportional Relationships (Extension)

Graph the values from the ratio table.

Time, x (seconds)	Height, y (meters)
3	2
6	4
9	6
12	8



rate of change = $\frac{y}{x}$

$= \frac{2}{3} \stackrel{?}{=} \frac{4}{6} \stackrel{?}{=} \frac{6}{9} \stackrel{?}{=} \frac{8}{12}$

$= \frac{2}{3} = \frac{2}{3} = \frac{2}{3} = \frac{2}{3}$ ✓

We can see that this ratio table has a ***constant*** **rate of change** (this is why the graph is a line).

*The graph of **EVERY** proportional relationship makes a LINE that passes through the origin (0, 0) *

What if we continued the table?

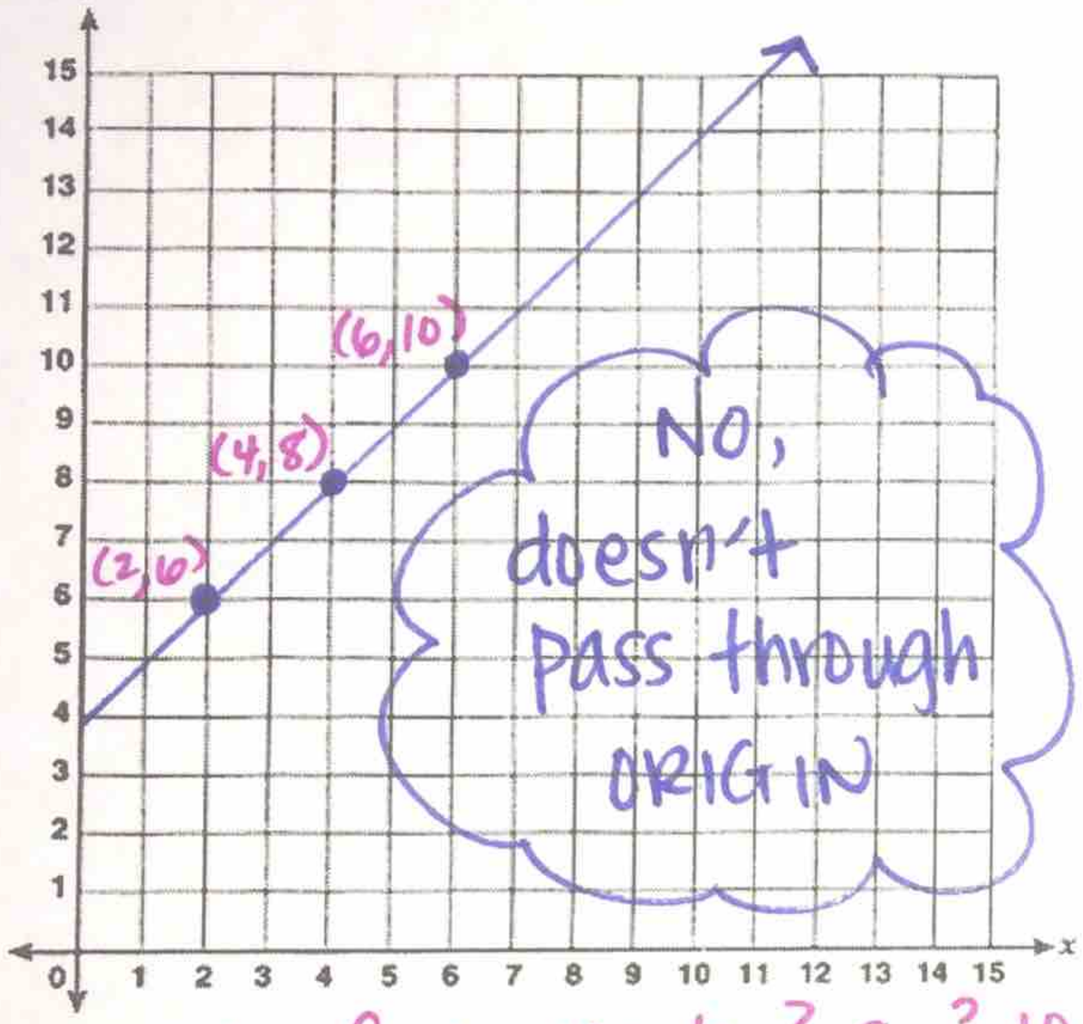
Time, x (seconds)	Height, y (meters)
0	0
3	2
6	4
9	6

+3, +3, +3 (Time); −2, −2, −2 (Height)

Graph to decide whether x and y are in a proportional relationship.

Ex:

x	2	4	6
y	6	8	10

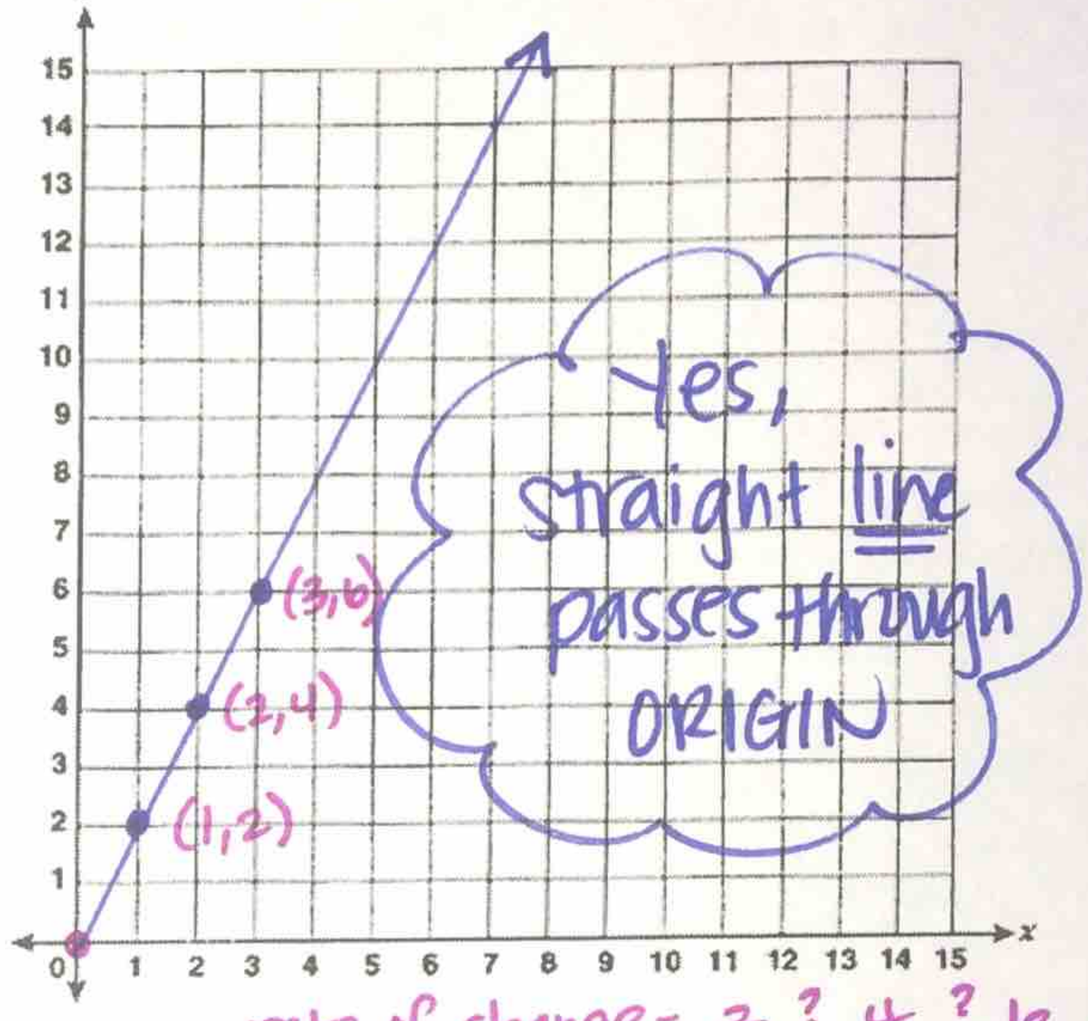


rate of change = $\frac{6}{2} \stackrel{?}{=} \frac{8}{4} \stackrel{?}{=} \frac{10}{6}$

$3 \neq 2 \neq \frac{5}{3}$ NO

Ex:

x	y
1	2
2	4
3	6

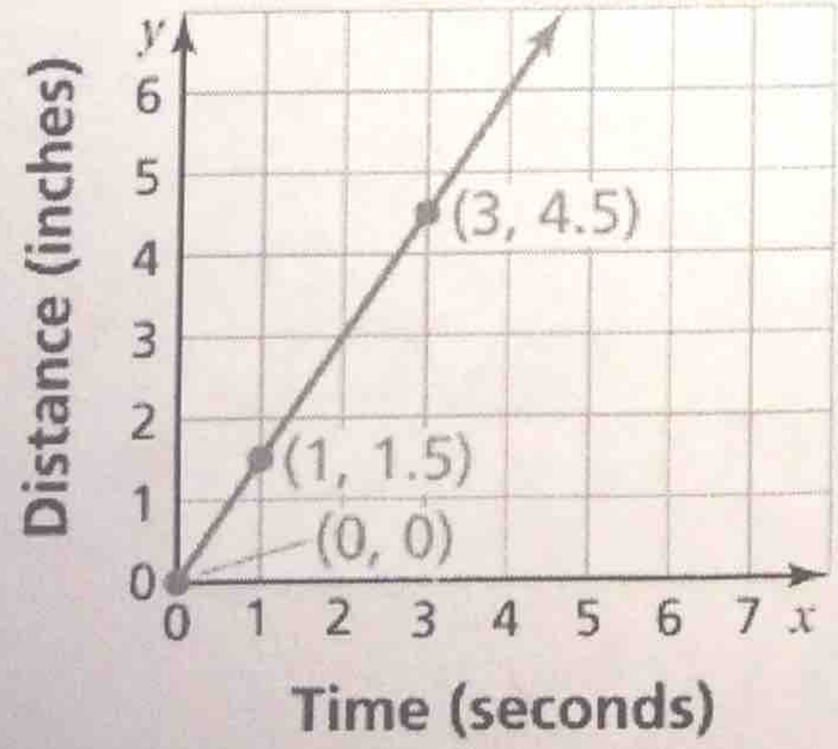


rate of change = $\frac{2}{1} \stackrel{?}{=} \frac{4}{2} \stackrel{?}{=} \frac{6}{3}$ YES

$= 2 = 2 = 2$ ✓

Ex: (a) Interpret each plotted point on the graph.
(b) Is the relationship proportional?
(c) If it is proportional, what is the unit rate?

Curiosity Rover at Top Speed



(a) (3, 4.5) = 3 sec, 4.5 in
(1, 1.5) = 1 sec, 1.5 in
(0, 0) = 0 sec, 0 in

(b) Yes - straight line through the origin

(c) unit rate = $\frac{4.5}{3} = \frac{1.5}{1} =$

$=$ 1.5 in/sec