

Vocabulary: * TIME is ^{almost} always on the X-Axis! *

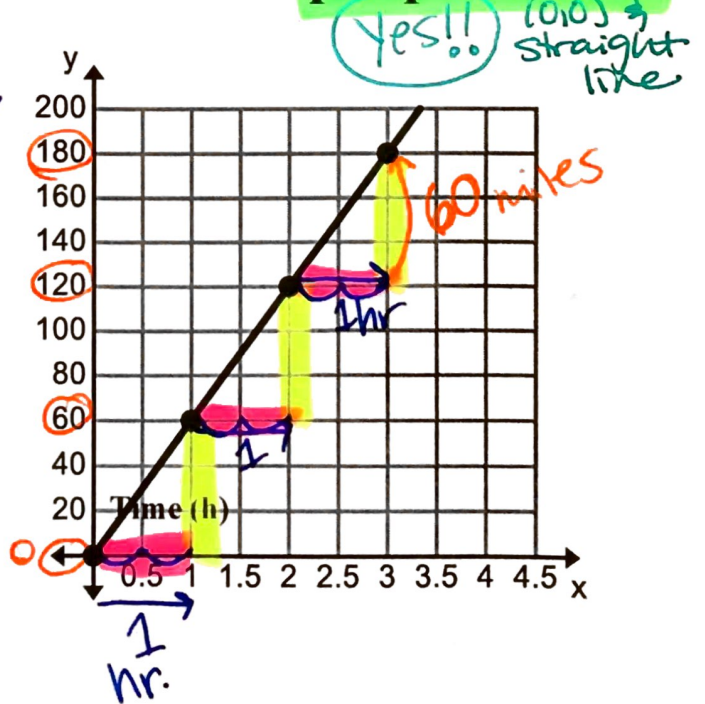
- **Rate of Change:** SLOPE with words!
miles per hour, ft. per second.... "PER"
- **Constant:** Something that STAYS the same.
Does NOT CHANGE.
- **Proportionality:** A relationship that:
 - ① contains the point (0,0) - the origin
 - ② is a straight line - Has a CONSTANT SLOPE.

Ex. 1: The graph represents the distance traveled while driving on a highway. Find the **constant rate of change**. Determine if the situation is **proportional**.

CROC = slope with words
 slope = $\frac{\text{rise}}{\text{run}}$ = $\frac{60 \text{ miles}}{1 \text{ hour}}$
 60 miles per hr.
 60 mph

3 ways to write

Distance (mi)



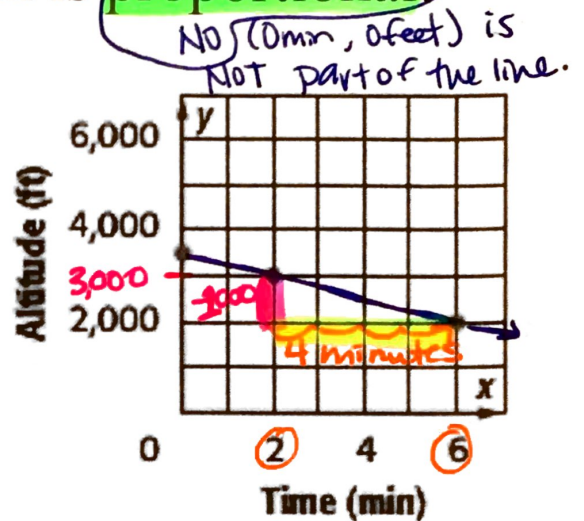
Ex. 2: The altitude y of a certain airplane after a certain number of minutes x is shown in the graph. Is the relationship linear? If so, find the constant rate of change. Determine if the situation is proportional.

→ Linear = straight line. **YES**

$$\text{CROC} = \frac{\text{rise}}{\text{run}} = \frac{-1000 \text{ ft}}{4 \text{ mins}} \text{ reduce!!}$$

$$= \frac{-250 \text{ ft}}{1 \text{ min}}$$

must have a 1 in the denominator!



Ex. 3: Find the rate of change from the table. Answers must include units. Determine if the situation is proportional. **-NO.**

$$\text{CROC: } \frac{140 - 170}{6 - 3} = \frac{-30}{3 \text{ transactions}}$$

reduce!

$$\frac{\$ -10}{1 \text{ trans.}}$$

Number of Transactions	Balance (\$)
0	200
3	170
6	140
9	110
12	80

Annotations: A box around (0, 200) is labeled 'This is NOT (0,0)'. Arrows indicate a decrease of -30 in balance for every +3 in transactions.

2 ways to check proportional

① Build the table backwards & see if (0,0) is there

② Divide each $\frac{y}{x}$ & you should get the CROC EVERYTIME.

$$\frac{170}{3} \neq \frac{140}{6} \neq \frac{110}{9} \neq \frac{80}{12}$$

Ex. 4: Find the rate of change from the table. Answers must include units. Determine if the situation is proportional. *Yes!*

$$\frac{y}{x} = \frac{\$17.50 - 7.00}{5 - 2} = \frac{\$10.50}{3 \text{ movies}}$$

\$3.50 per movie

$\frac{\$3.50}{1 \text{ movie}}$

Number of Movies	Cost (\$)
2	7.00
5	17.50
7	24.50
8	28.00

$\frac{28}{8} = 3.5$ $\frac{24.50}{7} = 3.5$ $\frac{17.50}{5} = 3.5$ $\frac{7}{2} = 3.5$
 (3.5) (3.5) (3.5) (3.5)

Ex. 5: Find the rate of change from the table. Answers must include units. Determine if the situation is proportional.

$$\frac{\$0}{3 \text{ rides}} = 0 = \frac{\$0}{2 \text{ ride}} = 0$$

\$0 per ride.

Not prop.

Number of Rides	Amusement Park Admission Fee
0	\$41.50
3	41.50
6	41.50
8	41.50
11	41.50

Ex. 6: Josh made \$15 after 2 hours of babysitting. He worked for a total of 6 hours and made \$45. Find his rate of change. Determine if the situation is proportional.

$$\frac{\$45}{6\text{hr}} = \frac{\$7.50}{1\text{hr}} \quad \checkmark$$

$$\frac{\$15}{2\text{hr}} = \frac{\$7.50}{1\text{hr}} \quad \checkmark$$

yes!
prop!

time (hr)	\$
X	Y
2	\$15
6	\$45

$$\frac{45 - 15}{6 - 2} = \frac{\$30}{4\text{hr}} = \frac{\$7.50}{1\text{hr}}$$