

What's Going On?

Checking In Word Wall!

Minds on Baby-sitters Club

Action! Partial Variation

Consolidation Tables of Values, Equations, & Graphs

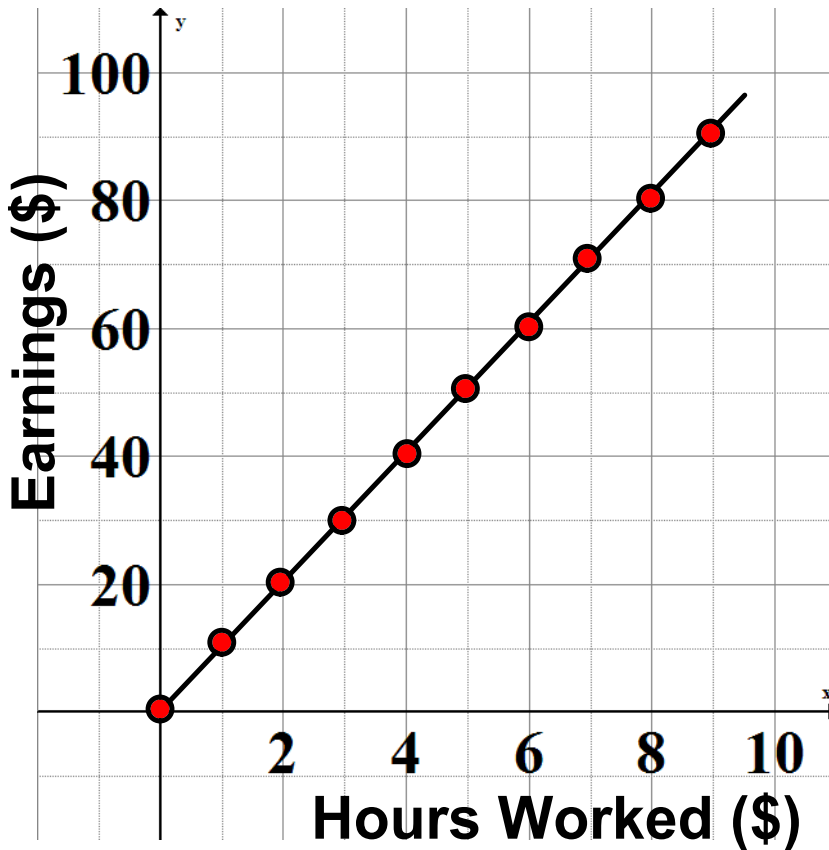
Learning Goal - I will be able to identify Partial Variation!

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Determine an equation for total earnings.



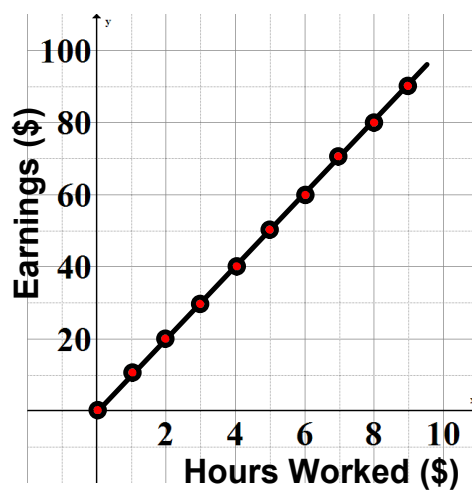
x	y
0	0
1	10
2	20
3	30

We always write our equations in terms of the dependent variable (y)

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$$E = 10h \quad \text{OR} \quad y = 10x$$



x	y
0	0
1	10
2	20
3	30

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$$E = 10h \quad \text{OR} \quad y = 10x$$

Is this an example of DIRECT VARIATION?
Why or why not?

This is an example of direct variation!

The independent variable is a constant multiple of the dependent variable!

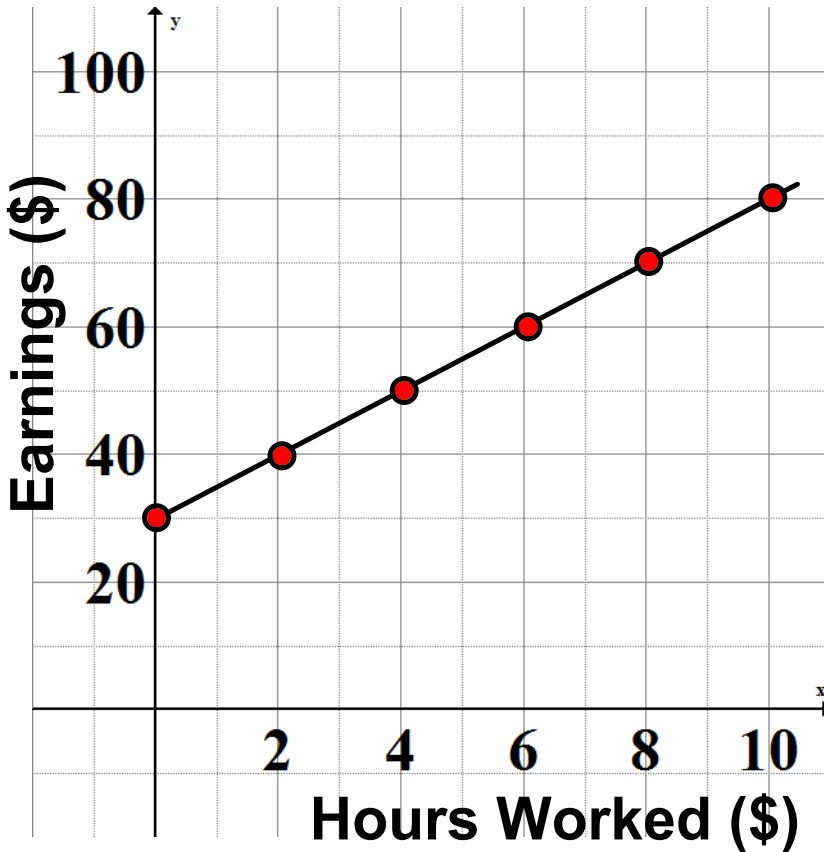
The graph of the line goes through the origin (0, 0).

When the independent variable is 0, the dependent variable is also 0.

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Determine an equation for total earnings.



x	y
0	30
1	35
2	40
3	45

Note: Brackets in the original image show a constant increase of \$5 per hour for the x values 1, 2, and 3.

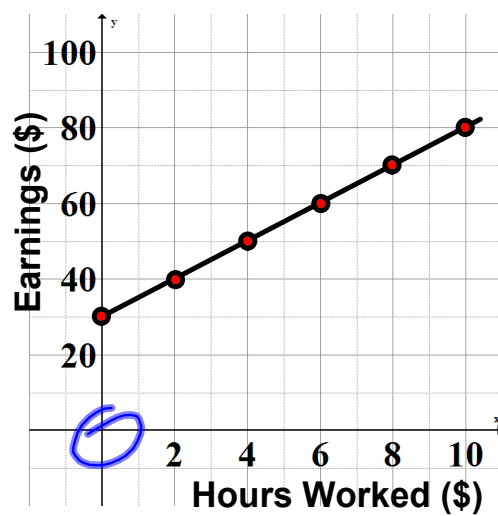
$$E = 5h + 30$$

$$y = 5x + 30$$

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$$E = 30 + 5h \quad \text{OR} \quad y = 30 + 5x$$



x	y
0	30
1	35
2	40
3	45

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$$E = 30 + 5h \quad \text{OR} \quad y = 30 + 5x$$

Is this an example of DIRECT VARIATION?
Why or why not?

This is **not** an example of direct variation!

The independent variable is **not** a **constant multiple** of the dependent variable!

The graph of the line **does not** go through the origin (0, 0).

When the independent variable is 0, the dependent variable is **not** 0.

Minds on

$$E = 30 + 5h$$

This is not an example of direct variation!

So what is it??

Parital Variation

A relationship between two variables in which the **dependent variable** is the sum of a constant (NOT ZERO) and a constant multiple of the **independent variable**.

Action!**Taxi!**

A taxi charges a flat rate of \$2 to enter the cab, plus 50 cents per kilometer.
Determine an equation to represent the cost of a taxi.

$$\text{Cost} = 2 + 0.5 \cdot \text{Distance}$$

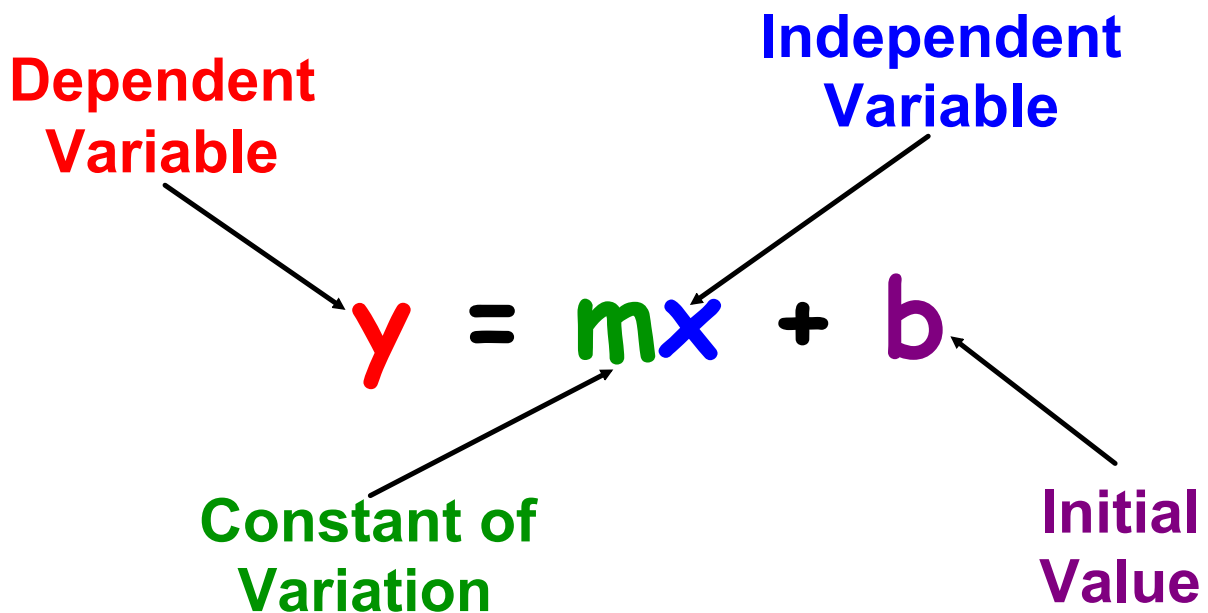
$$C = 2 + 0.5d$$

Fixed Cost Variable Cost

$$C = 0.5d + 2$$

Action!

Writing equations in the form $y = mx + b$



Copy and complete the table of values given that y varies partially with x .

x	y
0	6
1	9
2	12
3	15
4	18
5	21
7	27

Handwritten annotations: A green arrow labeled '1' points from x=0 to x=1. Blue arrows labeled '3' point from y=6 to y=9, 9 to 12, and 12 to 15. Red arrows labeled '3' point from y=15 to y=18, and 18 to 21. A red oval encloses the rows for (5, 21) and (7, 27). Green arrows labeled '2' and '6' point from x=5 to x=7 and from y=21 to y=27, respectively.

Identify the initial value of y and the constant of variation from the completed table.

The initial of y always occurs when $x = 0$.
When x is 0, y is 6.

The initial value of y is **6**.

The constant of variation is what y increases by when x increases by 1.
When x increases by 1, y increases by 3.

The constant of variation is **3**.

x	y
0	6
1	9
2	12
3	15
4	18
5	21
7	27

Handwritten annotations: A green oval circles the first row (0, 6). Red arrows show a change of +1 in x from 0 to 1, and a corresponding change of +3 in y from 6 to 9.

Write an equation relating y and x in the form $y = mx + b$.

Remember:

m is the constant of variation
 b is the initial value

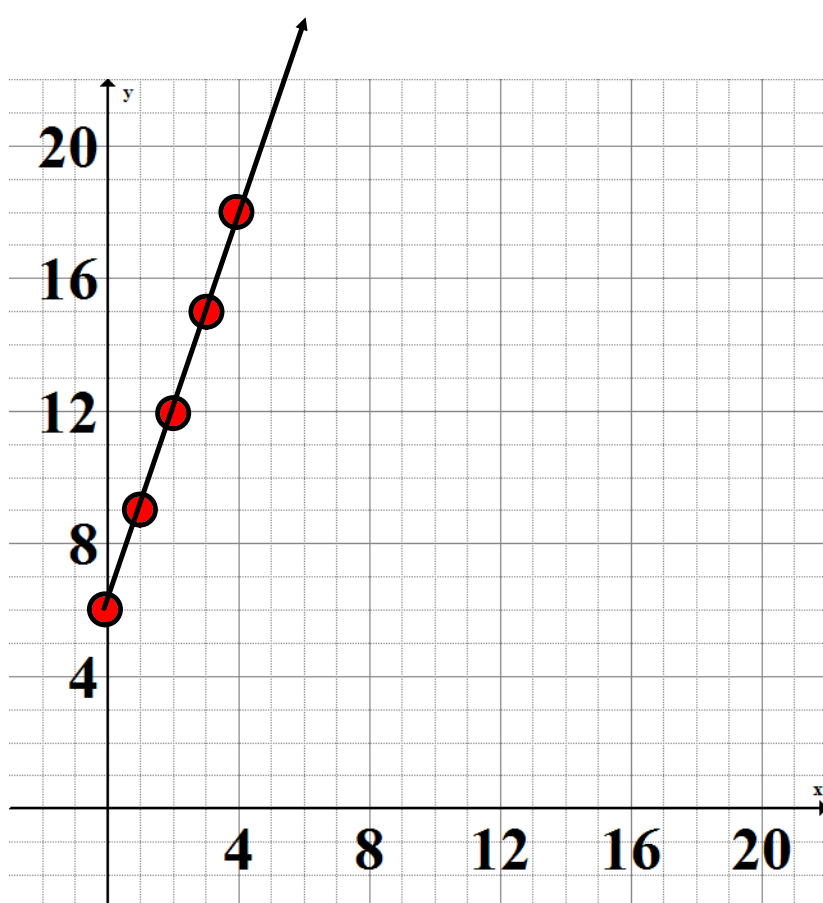
$m = 3$
 $b = 6$

$y = 3x + 6$

x	y
0	6
1	9
2	12
3	15
4	18
5	21
7	27

Handwritten annotations: An arrow labeled 'b' points to the y-intercept (0, 6). A green arrow labeled '+1' points from x=0 to x=1. A green circle labeled '+3' points from y=6 to y=9.

Graph this relation.



x	y
0	6
1	9
2	12
3	15
4	18
5	21
7	27

Consolidation

The KEY Points

1. A partial variation has an equation of the form $y = mx + b$.

b - the initial value of y

m - the constant of variation

(what y increases by when x increases by 1)

2. The graph of a partial variation is a straight line that **does not** pass through the origin.

Consolidation

Practice it!