


1.1 Linear Equations and Functions

Study 1.1

probl # 1, 5, 9, 13, 21, 33, 35

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1.1 Linear Equations and Functions

How can algebra help us?

Examples of problems: p. 55 #7, p. 64 # 6d

Suppose that want to grow plants on time to sell at Easter.
What conditions should you use? How much light?

Experiment: 5 seedlings in separate pots,
same soil, same amount of water, same temperature

Expose each pot to **varying amount of light**, and **observe growth**.

Hours/Day	Height (cm) after 4 weeks
0	
3	
6	
9	
12	

How many variables are there?
(Variables have changing values.)

What names should we give to the
variables?

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How can algebra help us?

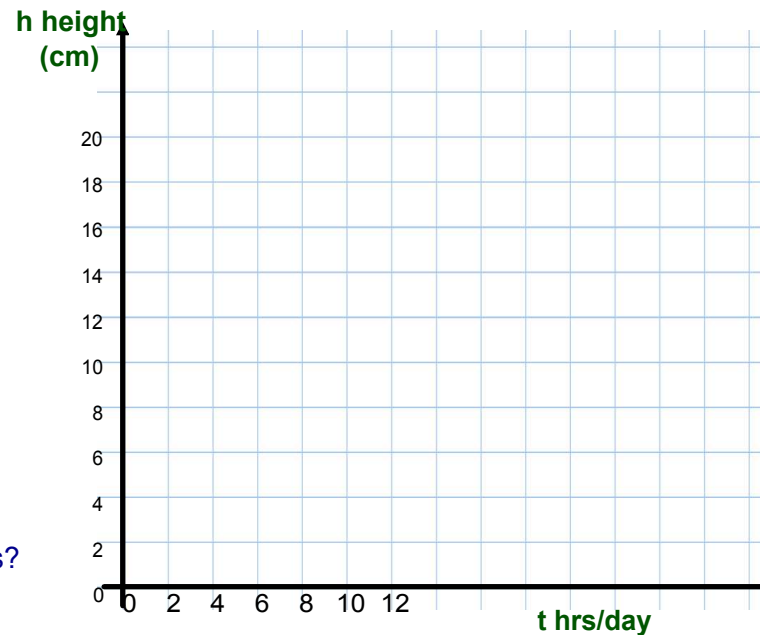
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t Hours/Day	h Height (cm) after 4 weeks
0	5
3	8
6	12
9	18
12	21



How many variables are there? **2**

1. time exposed to light, 2. height

What names should we give to the variables?

t, amount of time exposed to light

h, height of plants after 4 weeks

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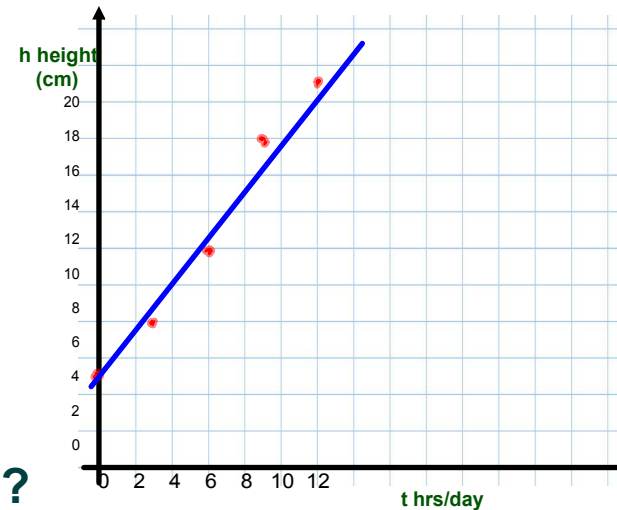
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So, what is the point?
What does all this mean?

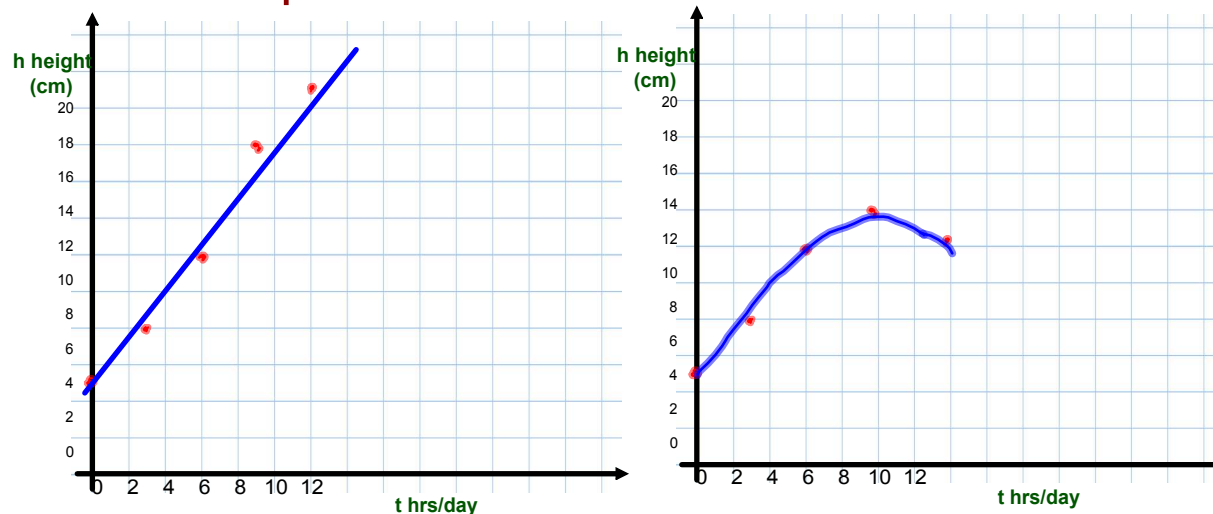
How can algebra help us?

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1.1 Linear Equations and Functions



How can algebra help us?

If we can describe conditions using algebra, or,
if we can **model** conditions using available data, then:

- > we can solve problems using algebra
- > we can interpret visual graphs

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1.1 Linear Equations and Functions

Independent Variable: 1) the variable we select
2) the variable manipulated
3) the variable on **horizontal axis**

Dependent Variable: 1) the variable we observe
2) the variable not manipulated
3) the variable on **vertical axis**

For sunlight experiment:

Independent Variable is **t**

Dependent Variable is **h**

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1.1 Linear Equations and Functions

Identify the independent (**Ind**) and the dependent (**Dep**) variables:

c is the cost in dollars of n pencils

a is the age of a car with the annual cost of repairs c

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1.1 Linear Equations and Functions

Identify the independent (**Ind**) and the dependent (**Dep**) variables:

c is the cost in dollars of n pencils

c is labeled **Dep** (Dependent) and n is labeled **Indep** (Independent).

a is the age of a car with the annual cost of repairs c

a is labeled **Indep** (Independent) and c is labeled **Dep** (Dependent).

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1.1 Linear Equations and Functions

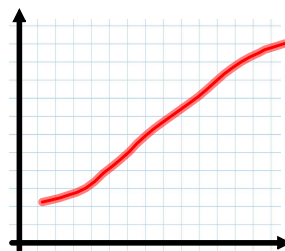
Let the Independent Variable increase

(x values get larger - goes right)



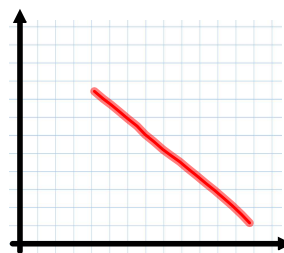
Graph is **INCREASING** if the dependent value increases

(y value goes up)



Graph is **DECREASING** if the dependent value decreases

(y value goes down)



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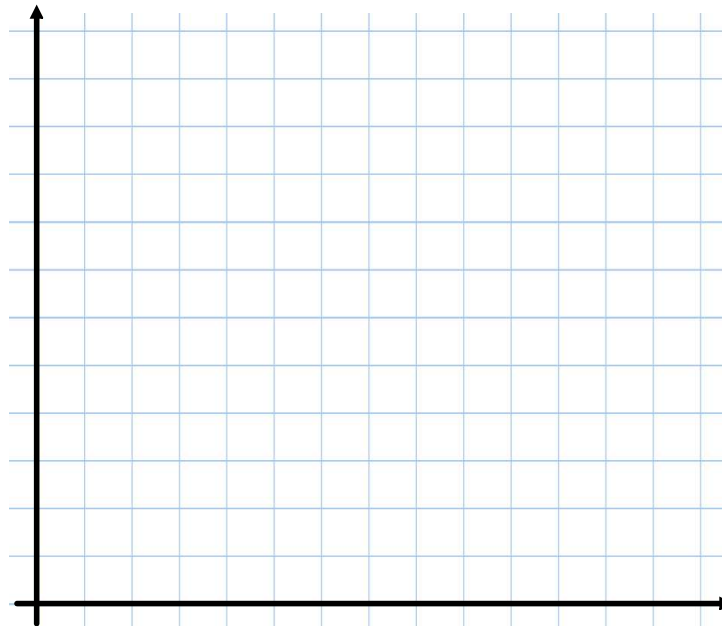
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1.1 Linear Equations and Functions

A runner was short on time but wanted to get a good workout. He had just read a study that suggested that alternating a hard run with a recovery jog would provide a workout equivalent to his normal run in half the time. He started with a short walk (warm up), then alternated a hard run with a recovery jog for 3 cycles, and then ended with a short walk (cool down).

Sketch a graph that shows the runner's speed over time.



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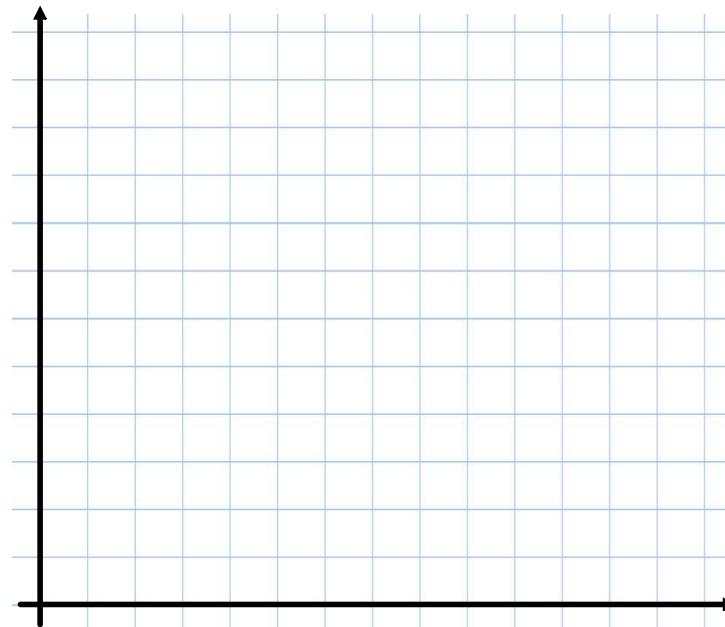
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1.1 Linear Equations and Functions

Let h be the height in feet of a tennis ball at t seconds after it was dropped. Sketch a graph that shows the height, including bounces.



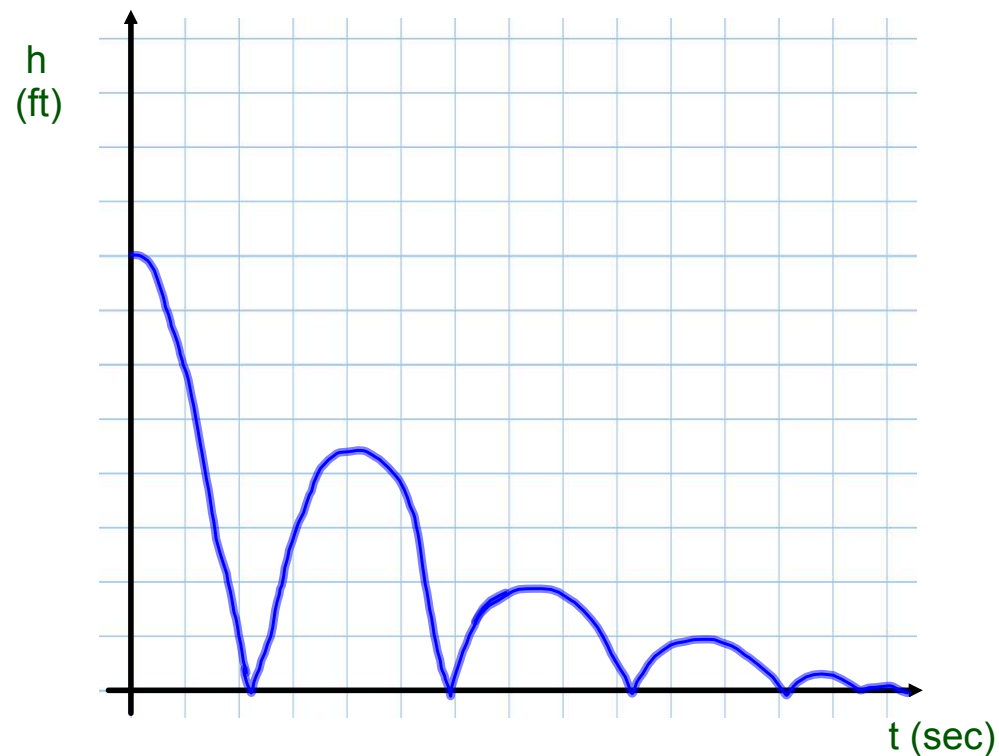
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