

Scalars vs Vectors Video Notes

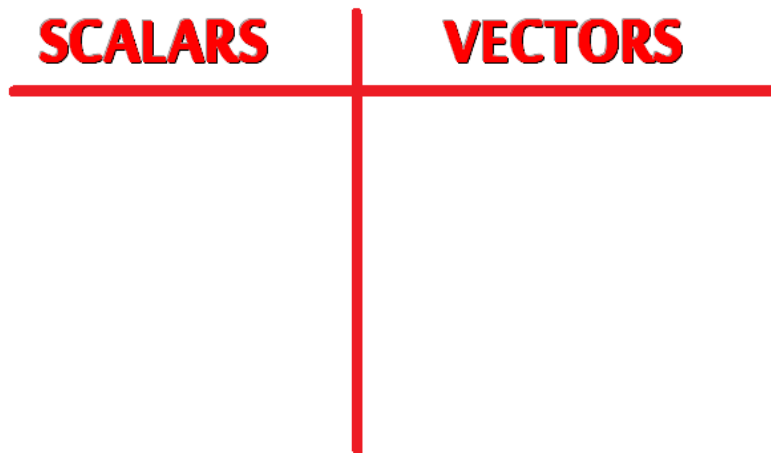
A scalar is _____ .

		Name	Units
<u>EXAMPLES OF SCALARS</u>	1	<i>Distance</i>	
	2		
	3		

$$\text{Speed} = \frac{\boxed{}}{\boxed{}}$$

A vector is _____ .

	Example of a Scalar	Example of a Vector
Name	<i>Distance</i>	
Example	<i>15 m</i>	
Meaning		



When Mr. Wood ran around his house and ended up where he started, his distance was _____ , but his displacement (position) was _____ .

Instant vs Average Video Notes

Journey to the Moon

Speed = $\frac{\text{[]}}{\text{[]}}$

S = $\frac{\text{[]}}{\text{[]}}$ = $\frac{\text{[]}}{\text{[]}}$ = []

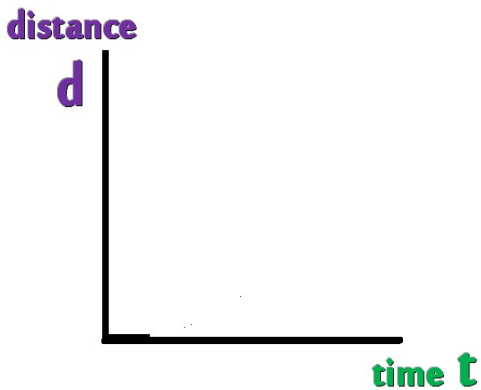
But now you re sat on the moon, your speed is _____ .

What you calculated above was your _____ .

Average Speed = $\frac{\text{[]}}{\text{[]}}$

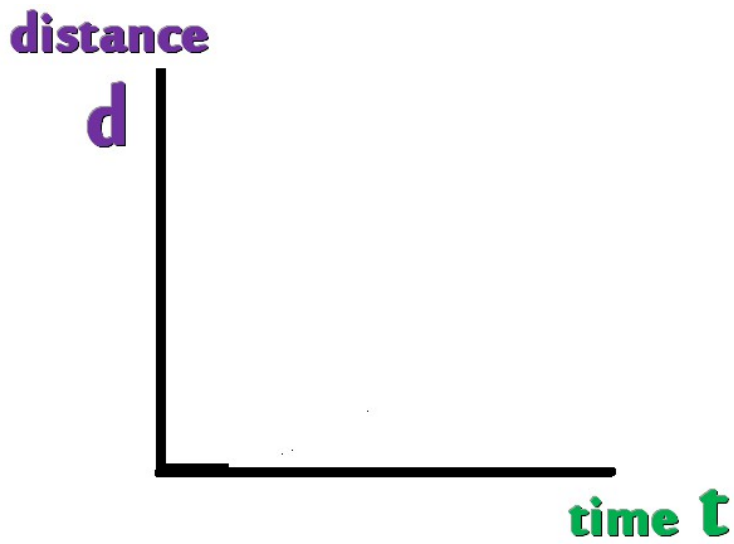
Instantaneous Speed = []

Pressing on the Gas Pedal

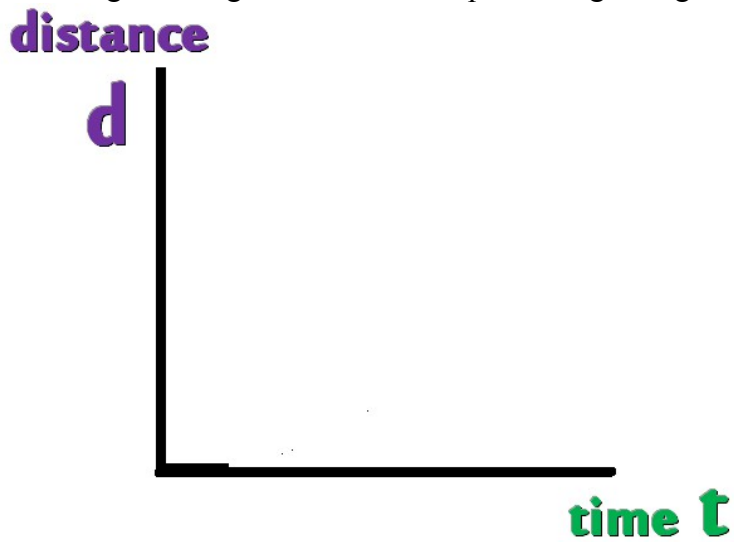


Describe what is happening in the graph:

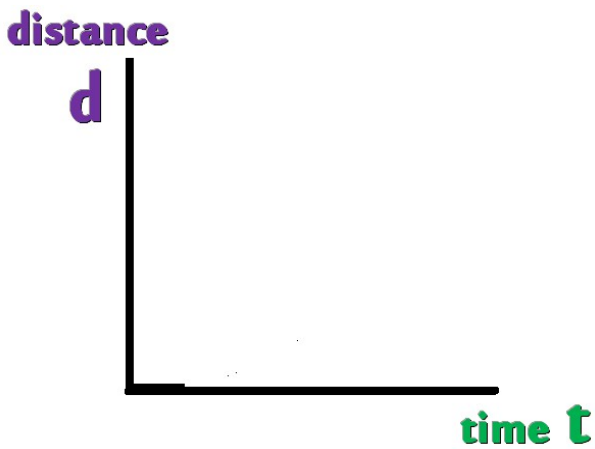
Graph showing how to get average speed using a slope calculation:



Graph showing how to get instantaneous speed using a tangent:



Constant Speed Car



$$\frac{\text{rise}}{\text{run}} = \frac{\square}{\square} = \square$$

$$\text{Avg. Spd} = \square$$

Graphs Video Notes

We can see that there are _____ dimensions.

You're moving at...

_____	because of the Earth spinning.
_____	because the Earth is moving around the sun.
_____	because the solar system is drifting towards other ones.
_____	because the solar system is orbiting around the center of the galaxy.
_____	because the Milky Way is moving towards other galaxies.

Why do YOU think you can't tell?

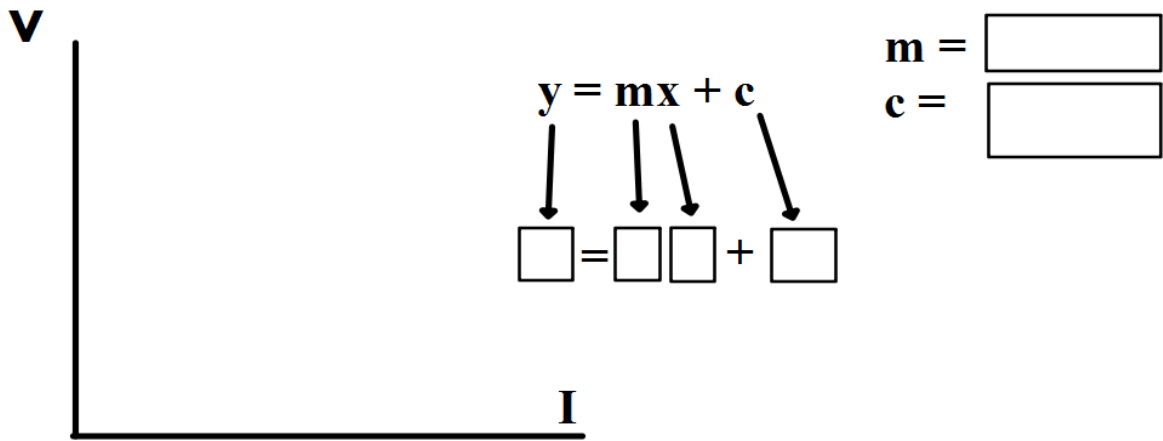
WHY are graphs important?

Equations of Straight Lines:

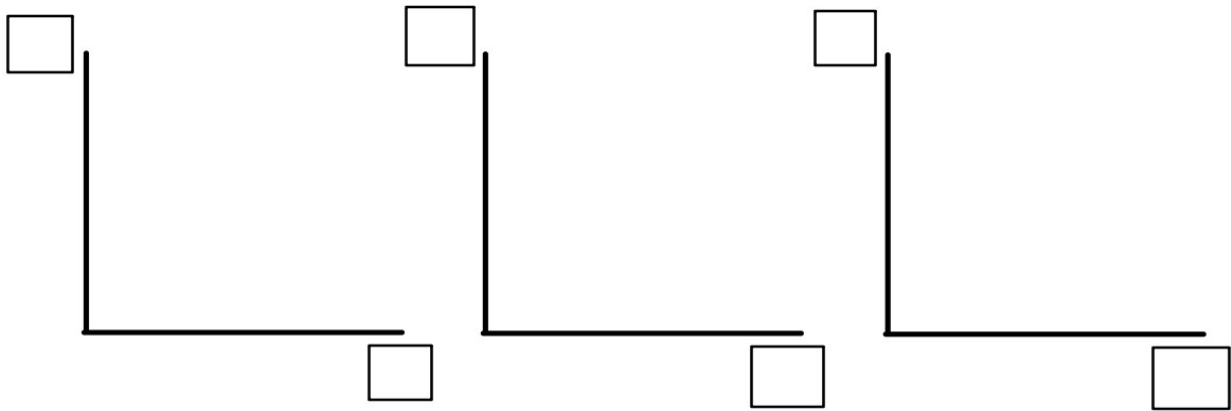
Equations of Curves:

More Complex Equations:

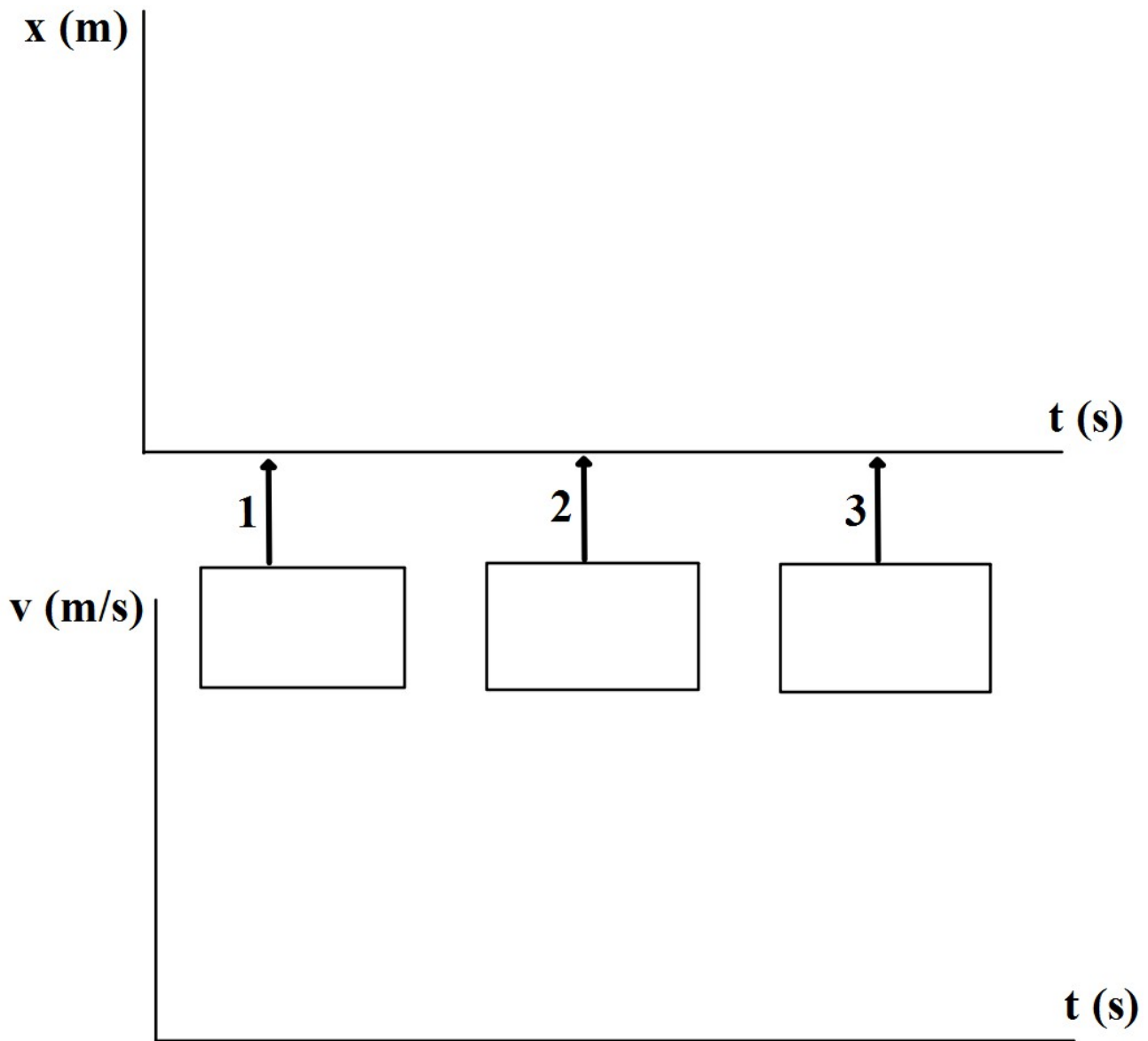
Ohm's Data



The Three Things We Graph



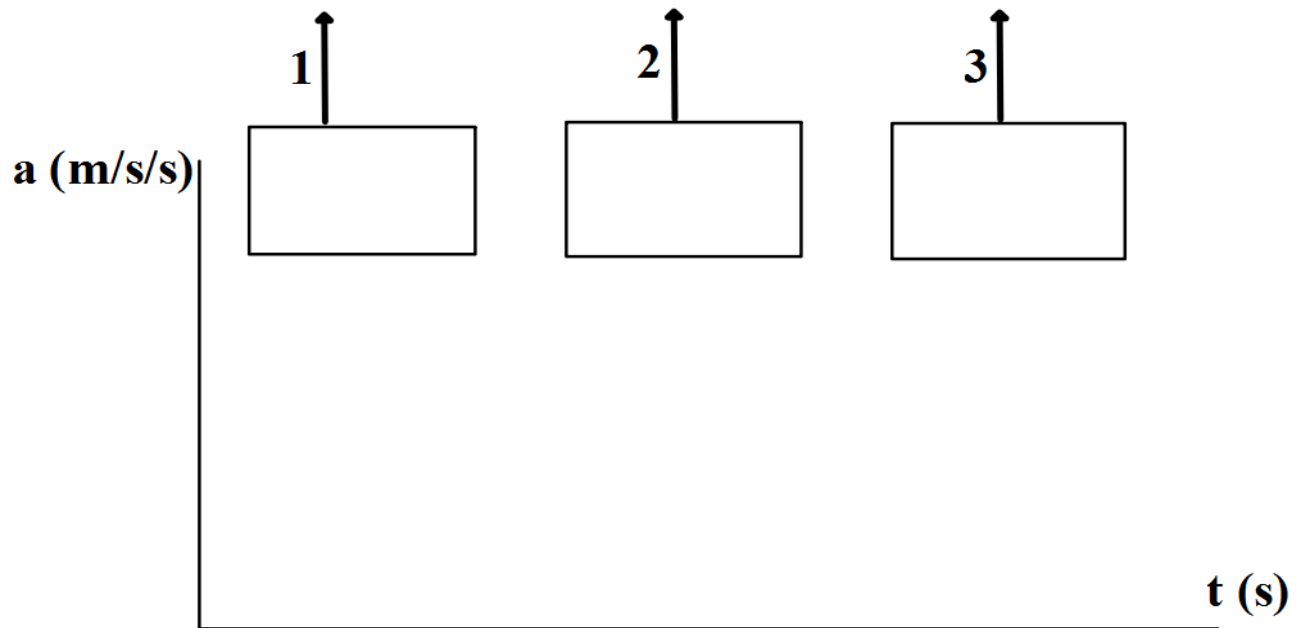
Car Speeding Up From Stop Light



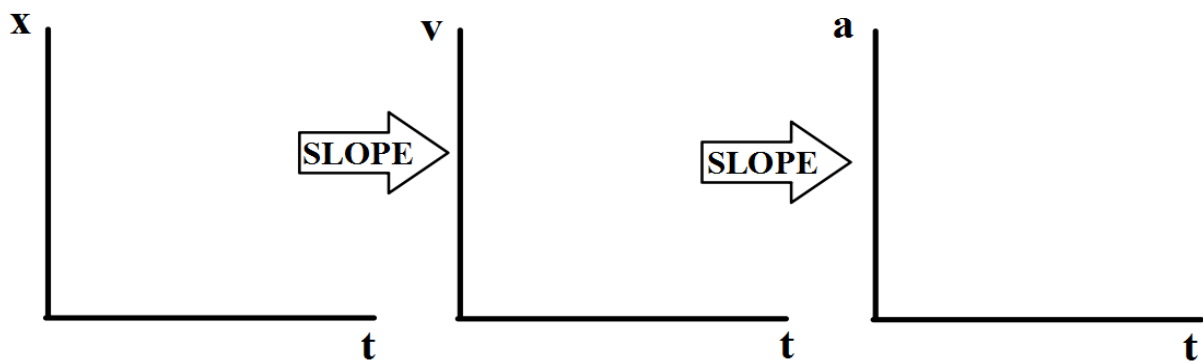
Acceleration is _____.

Why can't we tell that we are moving at 1.3 million miles per hour?

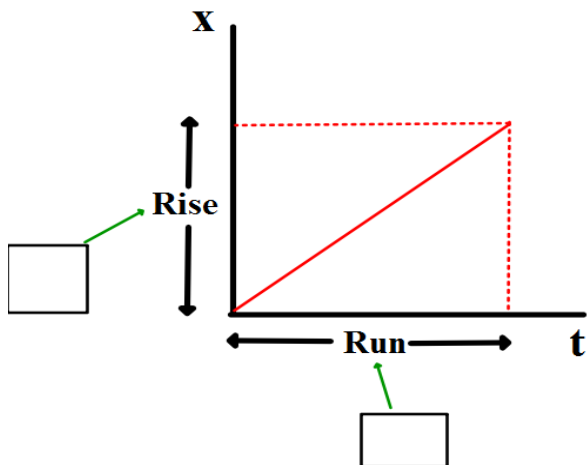
From velocity graph.



The Slope Method



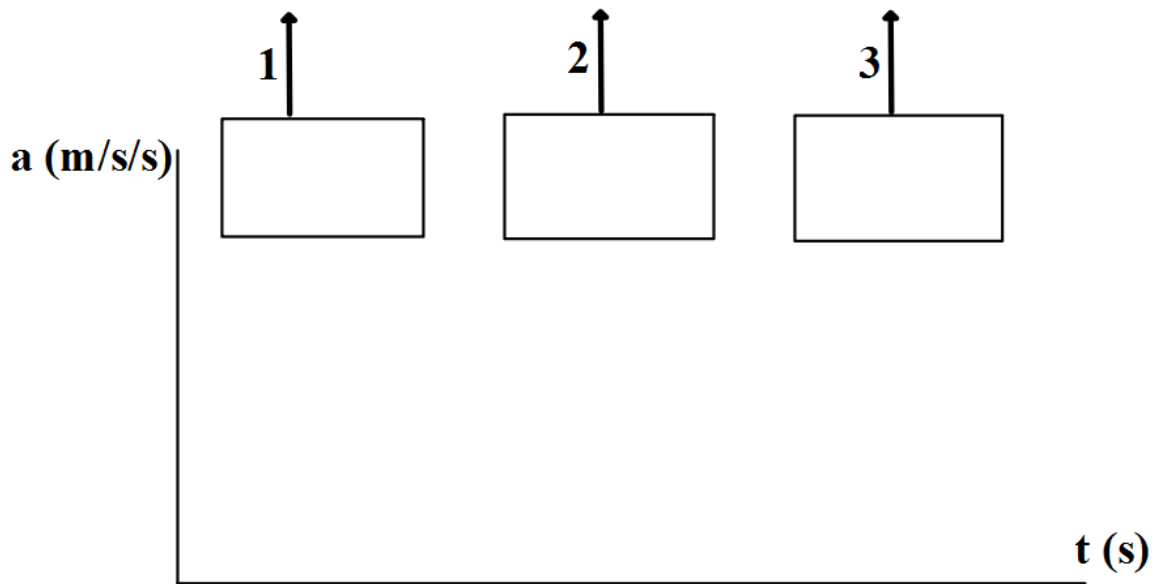
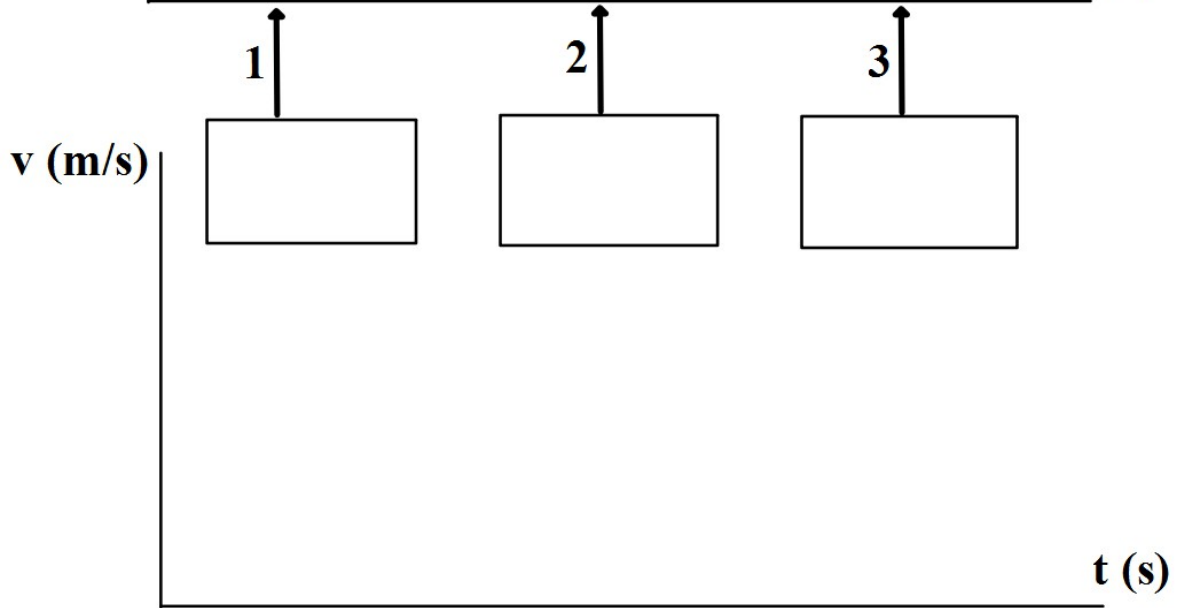
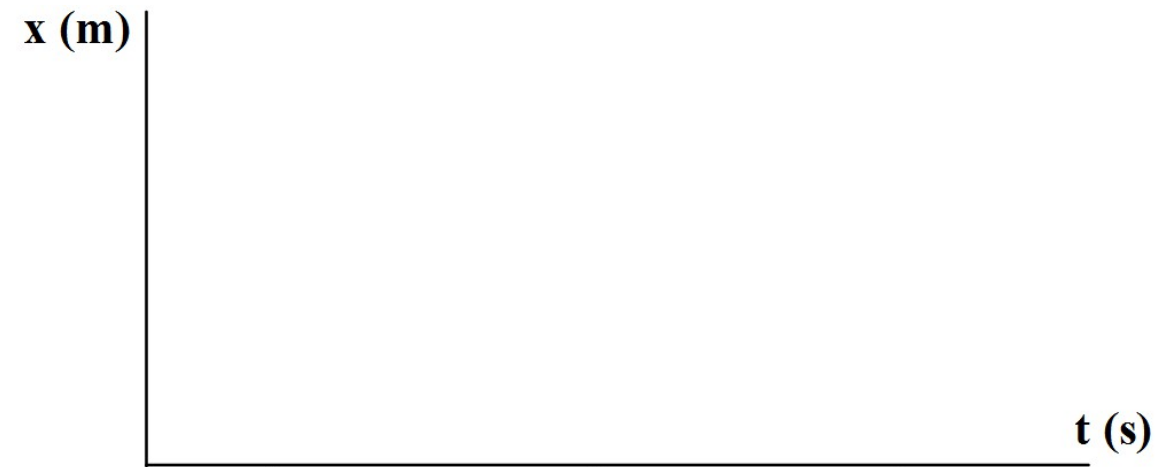
Example:



$$\text{Slope} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}}$$

$$\text{Velocity, } v = \frac{\boxed{}}{\boxed{}}$$

Using the Slope Method

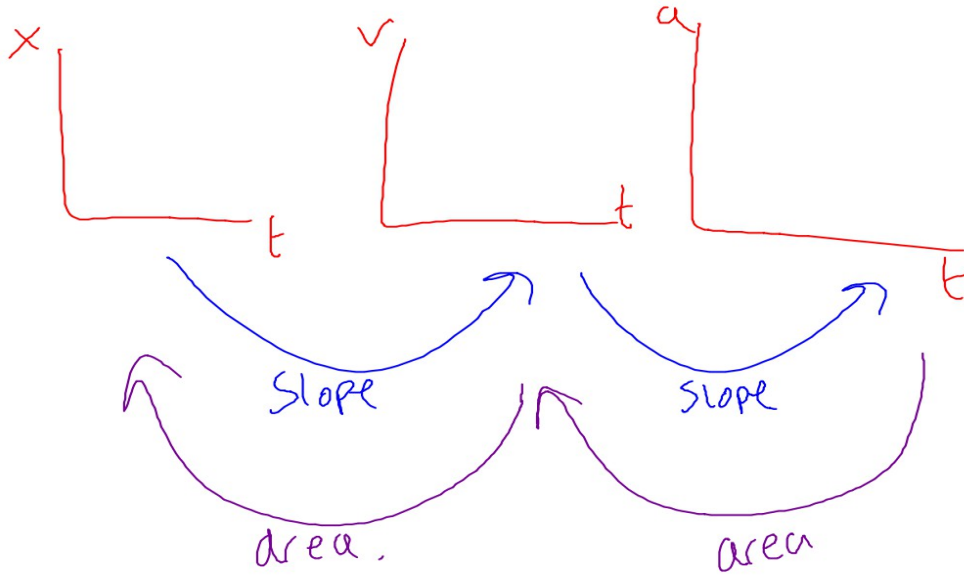


Calculations From Previous Page

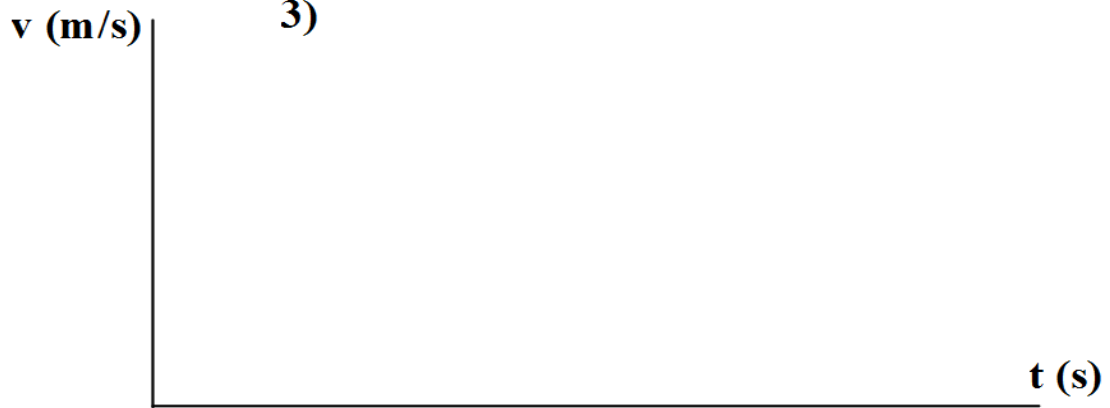
$$v = \frac{\text{rise}}{\text{run}} = \frac{x}{t} = \frac{\square}{\square} = \square$$

$$a = \frac{\text{rise}}{\text{run}} = \frac{\Delta v}{t} = \frac{\square}{\square} = \square$$

Going Backwards



- 1)
- 2)
- 3)



Going Back to Displacement...



Freefall Video Notes

If we drop a feather and a penny at the same time, which hits the ground first? _____

Why?

People in the video answered: _____

The Real Answer: _____

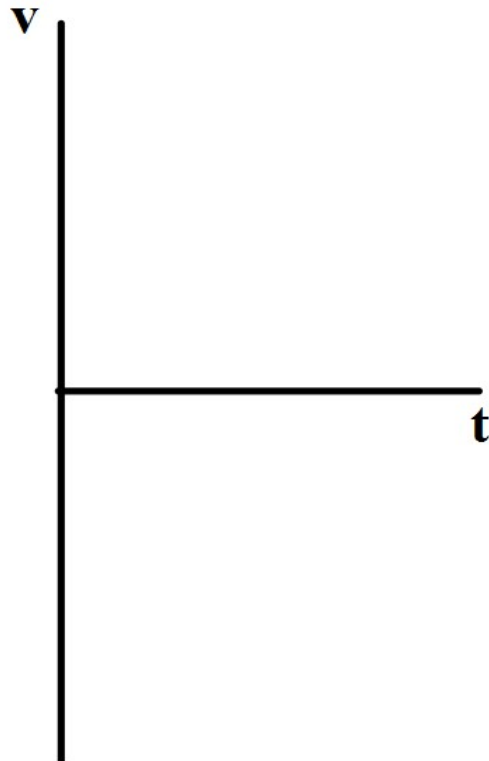
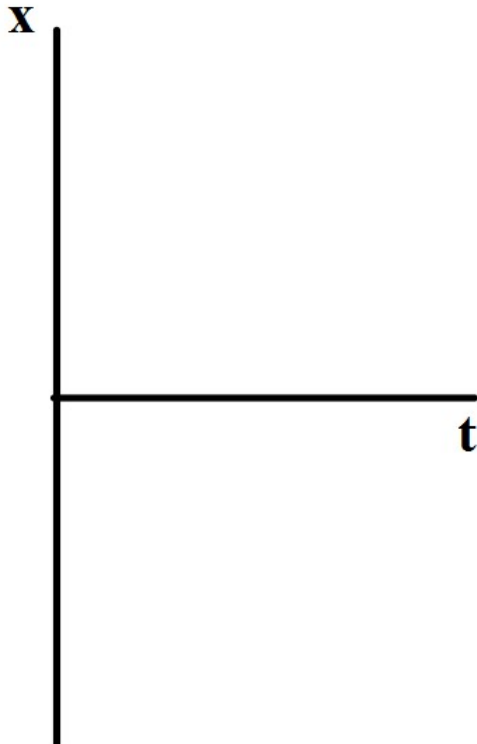
If you dropped a ping pong ball, and a bowling ball, off the empire state building _____

A “**terminal velocity**” is _____

Felix Baumgartner was able to break the world sky-diving records because _____

For 1D Motion, though, we will ignore the effect of air resistance.

What do YOU think a displacement-time and velocity-time graph would look like for a falling object with no air resistance? Draw them below:

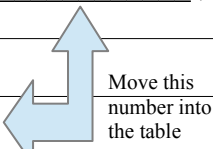


The Acceleration Due To Gravity on Earth is:

This means _____
_____.

When you drop a ball, or step out of a plane, your velocity for that first instant is _____ ,

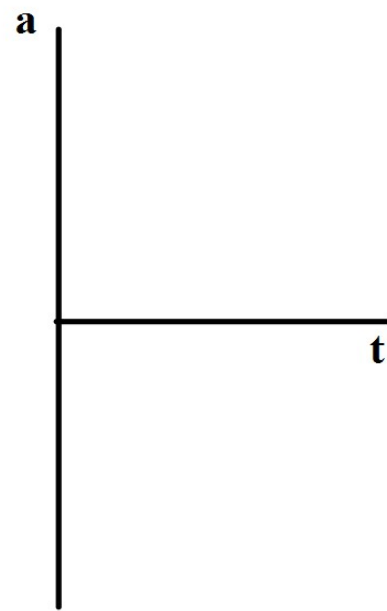
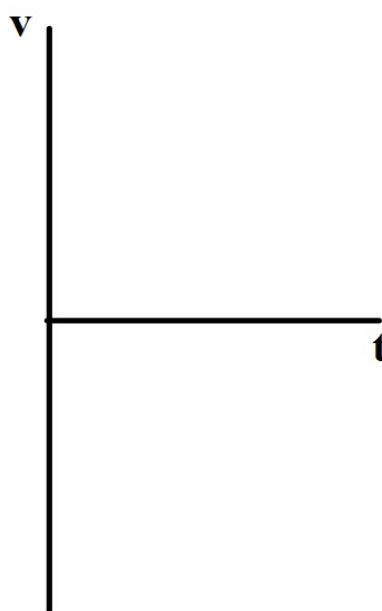
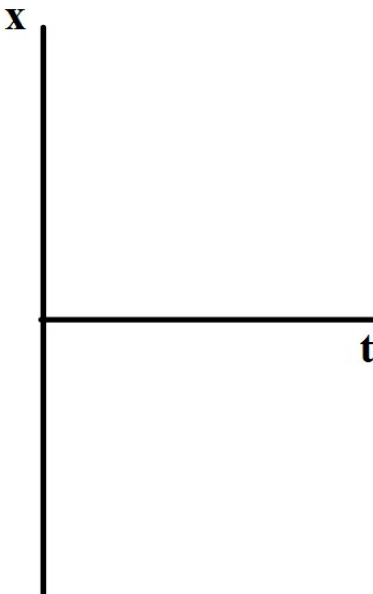
Time of Falling	Velocity
t = 0	v =
t = 1	v =
t = 2	v =
t = 3	v =



Acceleration Due To Gravity on the Moon is:

Acceleration Due To Gravity on Jupiter is:

Answer to Falling Object Graphs



Why are the above graphs NEGATIVE?

Notes from Veritasium video:

Notes from SciShow video (optional):

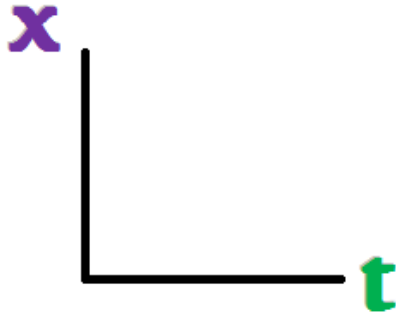
Notes from TedEd video (optional):

Why is the term Zero Gravity wrong?

rise

run

FOR

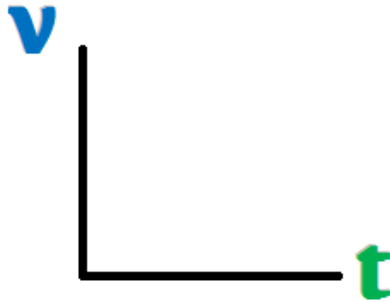


$$\frac{\square}{\square} = \square$$

rise

run

FOR



$$\frac{\square}{\square} = \square$$

Equations of Constant Acceleration

Galileo derived them first.

Sagredo objected because _____
_____.

Sagredo Quote (optional):

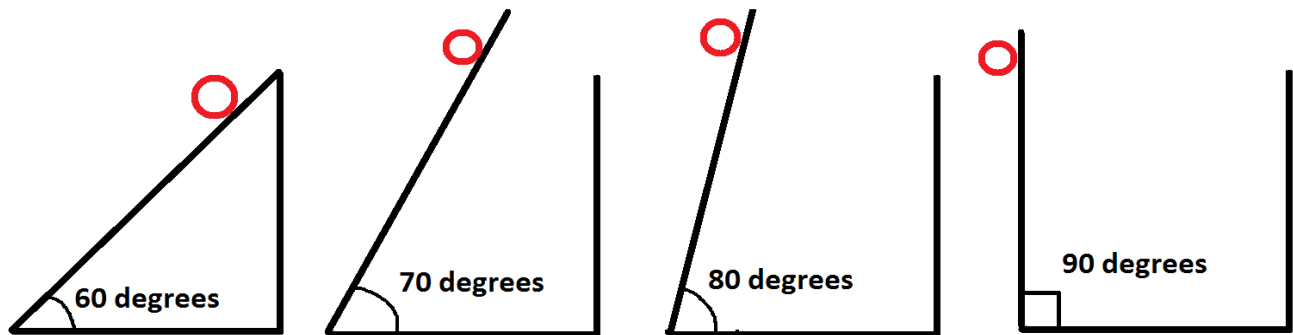
Derivation (watch the video carefully, but notes on this part are optional):



Final Five Equations

	Equation	Missing Variable	
1			a is _____
2			x is _____
3			v_i is _____
4			v_f is _____
5			t is _____

Galileo's Experiment



Explanation:
