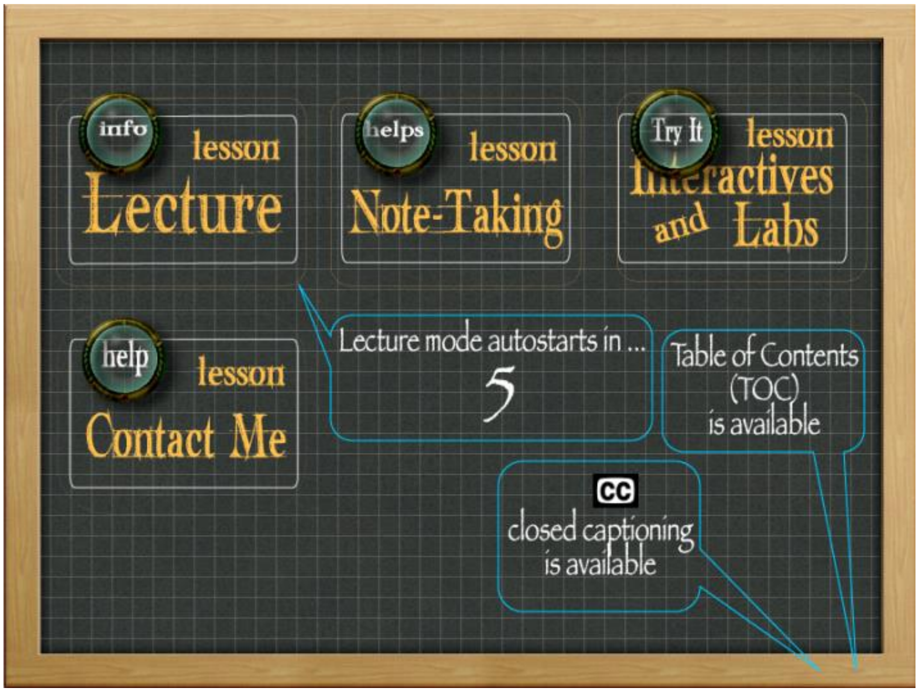
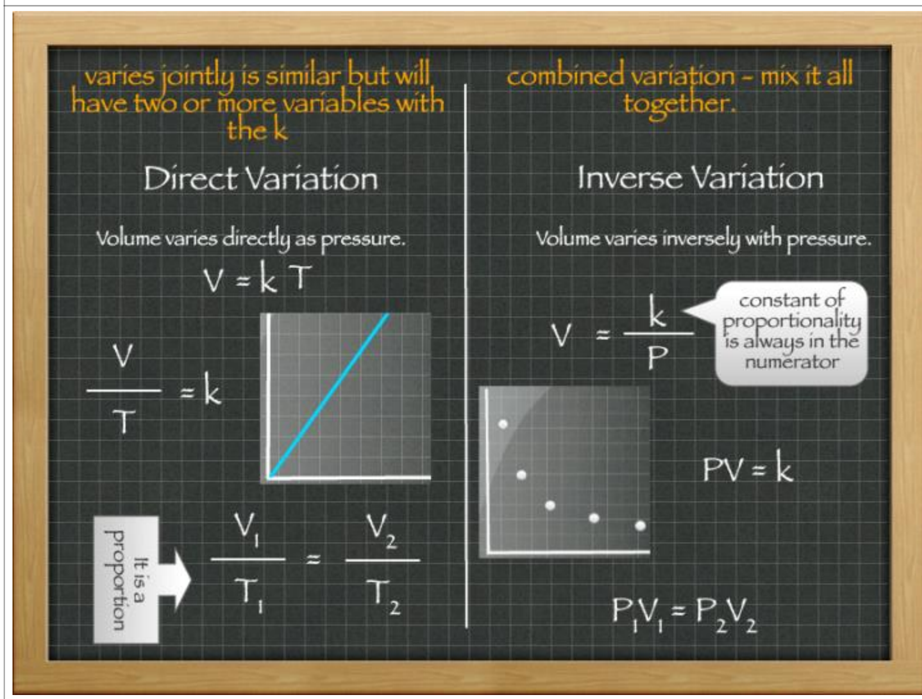
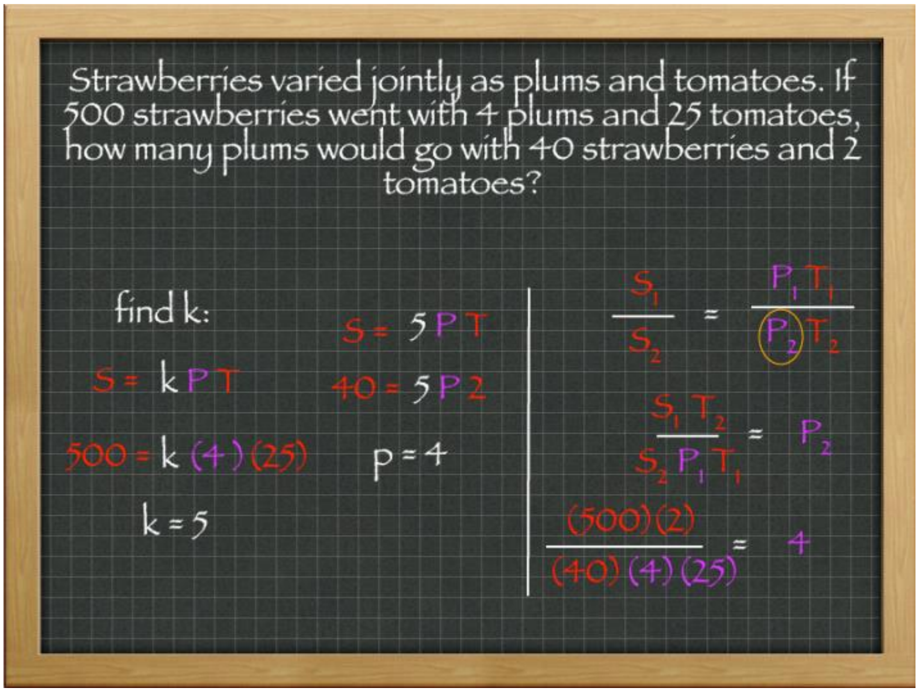
Joint_and_Combined_Variations

Thursday, January 19, 2012
5:38 PM

Slides	Notes
	
	This page is a bit of review. You have learned about direct variation. The joint variation will be a lot like this one, but you will have more variables You have also learned about inverse variation. Combined variation will be a mix of direct and inverse variation so you will be working with more variables in more ways. Before you move on, study this page to be sure you have a good handle on what you have been working on so far. Click next when you are ready to move on.



Lets' try and example of joint variation first.

"Strawberries varied jointly as plums and tomatoes. If 500 strawberries went with 4 plums and 25 tomatoes, how many plums would go with 40 strawberries and 2 tomatoes.

As you have experienced with direct variation, you have two different ways you can solve these. One involves finding the constant k. The other method uses proportions. We will solve this one both ways so you can see how each is done when you will have the extra variables.

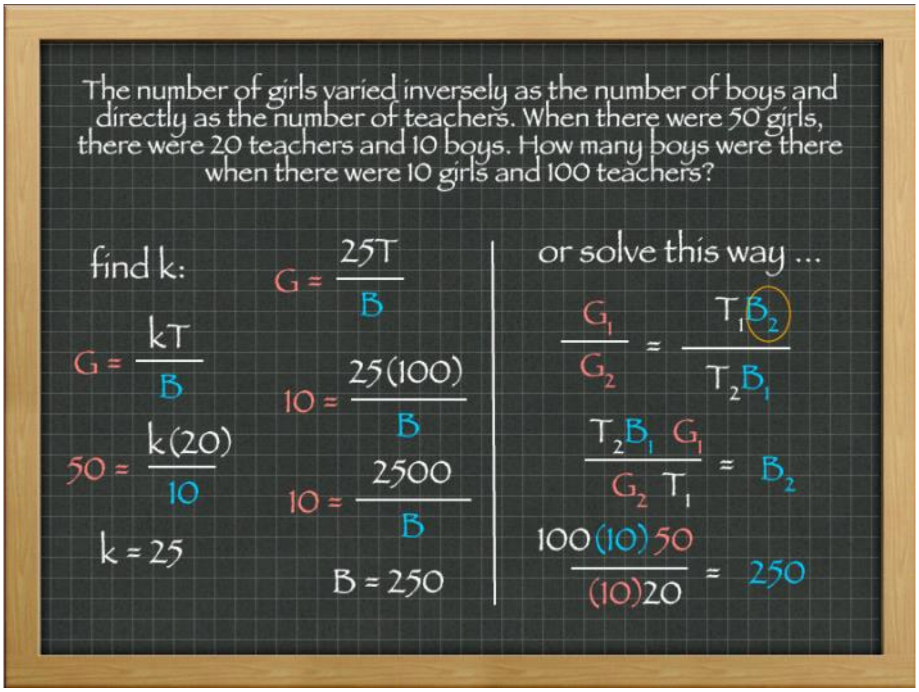
As with the direct variation method and using a constant to solve with, you set the variable that the focus of the relationship on one side of the equal sign and the k, which is the constant, on the other. Anything that varies jointly and is in the original scenario will go on the same side as the k.

Now just solve for k.

Now plug that value in for the equation and plug in all the second scenario values. The number of plums is 4.

Now let's try the proportion method. When you have a direct or a joint variation, all the first scenario values will go in the numerator and all the second scenario values go in the denominator.

Just shuffle the equation around to solve for the unknown variable and plug in the values. The number of plums is 4.



In combined variations, you will just see the direct and inverse variations mentioned In the same relationships.

If you prefer to use the solving for a constant method, set up your direct variation elements in the numerator with the k and the inverse relationships in the denominator. Plug in the values for the first scenario to get the k.

Then plug the k in to the equation along with the second scenario's values and solve for your unknown.

Or, you can solve with proportions. To the left place your variable that was the focus of the declared relationship with the first scenario in the numerator and the second scenario variable in the denominator.

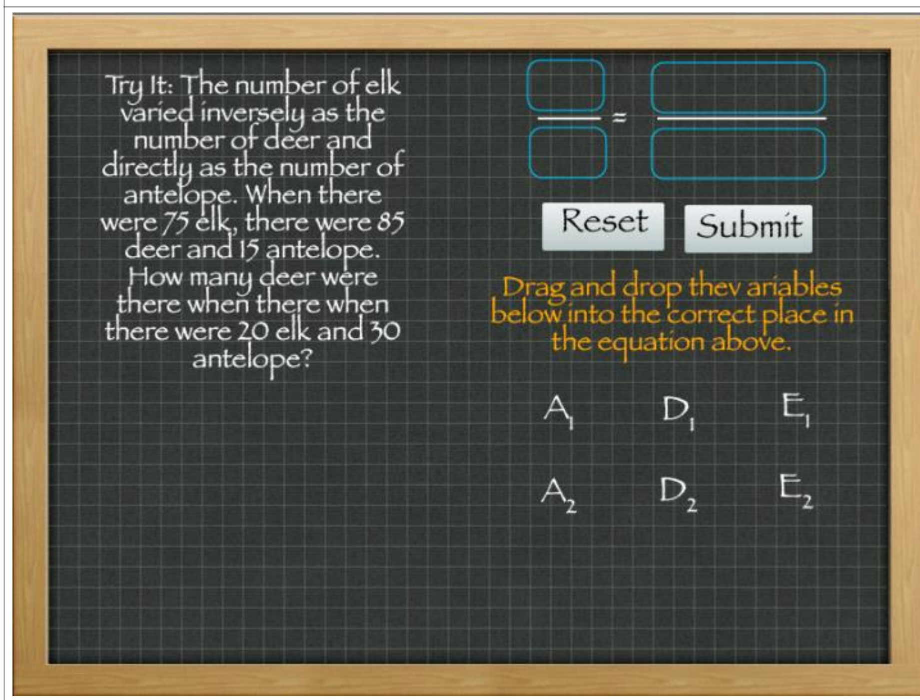
Anything that is a direct relationship will go in the numerator. Anything with an inverse relationship goes in the denominator.

Now shuffle the equation to solve for your unknown. A quick way to think about this is if it was in the numerator on one side, it will be in the denominator on the other side and vice-versa.

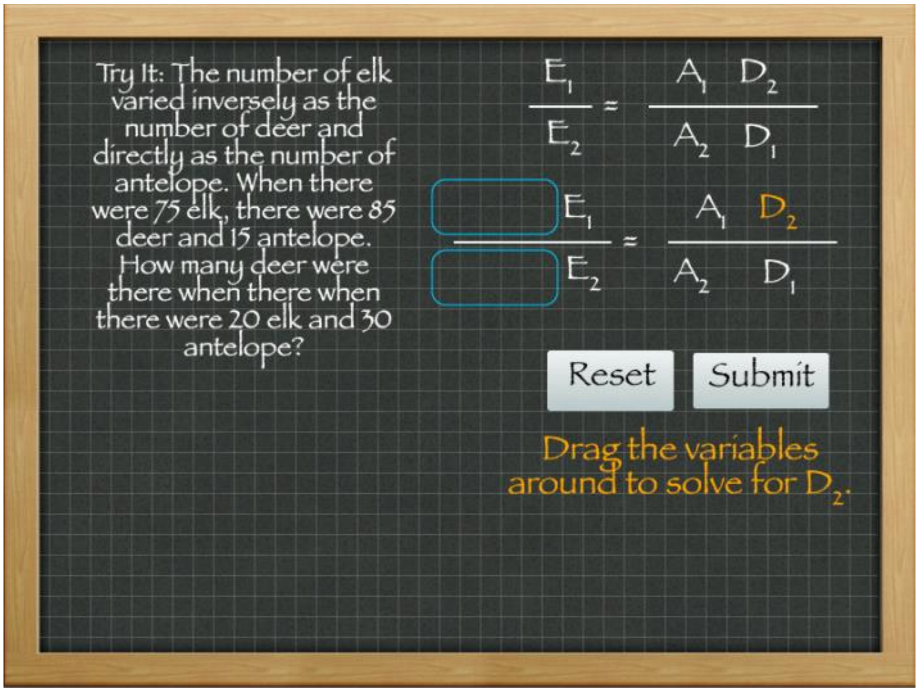
Plug in your values and solve.

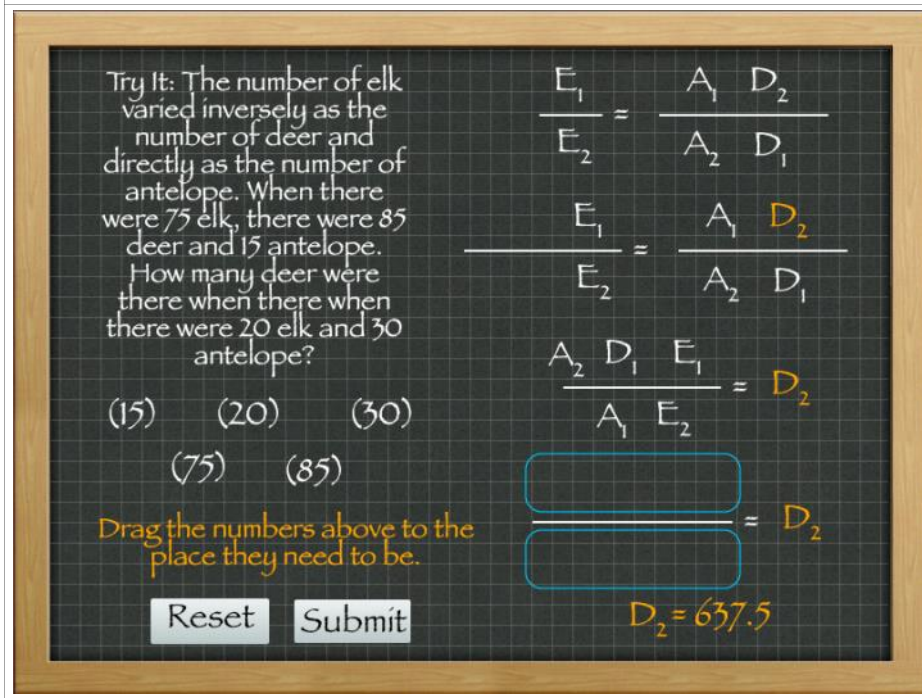
Both methods came up with 250.

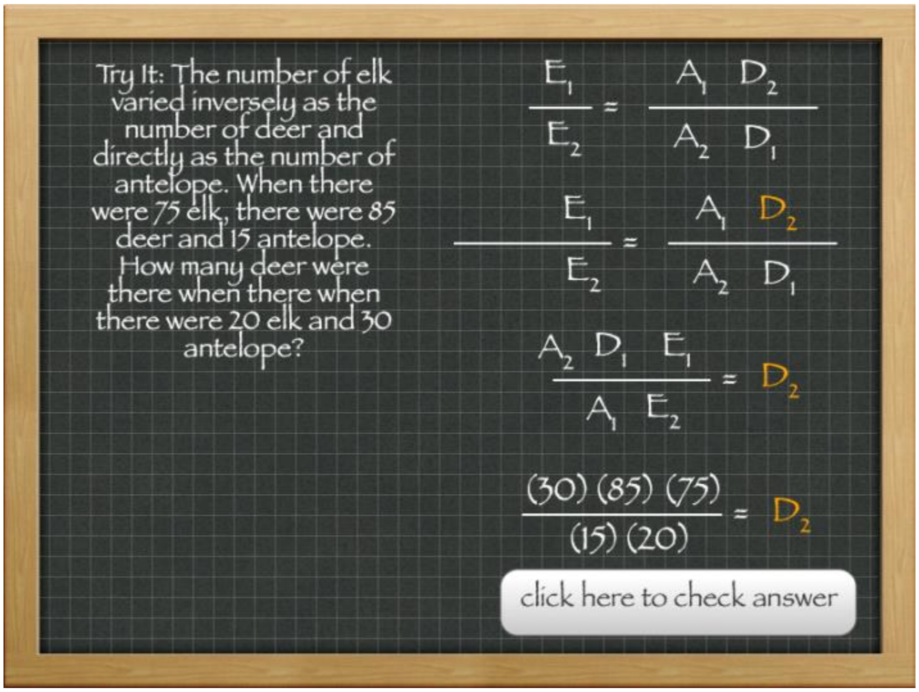
Now it is your turn ...



Try it


Try It: The number of elk varied inversely as the number of deer and directly as the number of antelope. When there were 75 elk, there were 85 deer and 15 antelope. How many deer were there when there were 20 elk and 30 antelope?
$\frac{E_1}{E_2} = \frac{A_1 \quad D_2}{A_2 \quad D_1}$
$\frac{E_1}{E_2} = \frac{A_1 \quad D_2}{A_2 \quad D_1}$
Reset
Submit
Drag the variables around to solve for D_2.


Try It: The number of elk varied inversely as the number of deer and directly as the number of antelope. When there were 75 elk, there were 85 deer and 15 antelope. How many deer were there when there were 20 elk and 30 antelope?
(15) (20) (30)
(75) (85)
Drag the numbers above to the place they need to be.
Reset
Submit
$\frac{E_1}{E_2} = \frac{A_1 \quad D_2}{A_2 \quad D_1}$
$\frac{E_1}{E_2} = \frac{A_1 \quad D_2}{A_2 \quad D_1}$
$\frac{A_2 \quad D_1 \quad E_1}{A_1 \quad E_2} = D_2$
$= D_2$
$D_2 = 637.5$


Try It: The number of elk varied inversely as the number of deer and directly as the number of antelope. When there were 75 elk, there were 85 deer and 15 antelope. How many deer were there when there when there were 20 elk and 30 antelope?
$\frac{E_1}{E_2} = \frac{A_1 D_2}{A_2 D_1}$
$\frac{E_1}{E_2} = \frac{A_1 D_2}{A_2 D_1}$
$\frac{A_2 D_1 E_1}{A_1 E_2} = D_2$
$\frac{(30)(85)(75)}{(15)(20)} = D_2$
click here to check answer


Congratulations! You have completed this topic
Give us feedback about this lesson if you wish...
help
lesson
Contact Me