

**MoveOver :Part Two - Limitations**

LiveMath is designed for you to do math...not watch math. You have already tried your hand at moving expressions around to perform operations such as substitution.

This same type of interaction is also possible within expressions and equations to manipulate the objects algebraically.



LiveMath has some self respect. It will not let you do any manipulation you want. LiveMath wants to help you learn math and do math. So, it is always looking over your shoulder.



Consider the equation

$$3x - 5 = (x + 3)^2$$

Mathematically speaking you cannot just move over the x from the right hand side to the left hand side and get

$$3x - 5 - x = (3)^2$$

The x on the right hand side is inside a squared expression. To free up that x for movement the square has to be removed by taking the square root of both sides.

LiveMath knows this:

$$\square 3x \square 5 = (x + 3)^2$$

$$\triangle (3x \square 5)^{\frac{1}{2}} \square x = 3 \quad \text{Move Over}$$



In addition LiveMath also knows that sometimes you just want to manipulate the symbols around and sometimes you have numbers in the background and need to think about dividing by zero, multiplying by zero, and positive/negative square roots. You can tell LiveMath that you want to pay attention to these cases via the cases button.



consider cases



don't consider cases

The previous move was done without paying attention to cases. Here is the same move with cases turned on:

$$\square 3x \square 5 = (x + 3)^2$$



$$\triangle (3x \square 5)^{\frac{1}{2}} \square x = 3$$



$$\triangle \square (3x \square 5)^{\frac{1}{2}} \square x = 3 \quad \text{Move Over}$$



Livemath has started two different and separate paths for you. They are each Case Theories inside Case Theory Boxes. More on these later.



I Don't Think So



Sometimes LiveMath takes unexpected steps.



Try moving the x in $3x$ from the right hand side to the left hand side:

$$\square 3x + 1 = \sqrt{(x^3 + 1)} \square 3x$$



Try moving the x in x^3 from the right hand side to the left hand side:

$$\square 3x + 1 = \sqrt{(x^3 + 1)} \square 3x$$

$$\triangle \log_x ([3x + 1]^2 + 3x \square 1) = 3 \quad \text{Move Over}$$



\log_x !!?

If you trace out some steps for moving that x over, you probably would decide to take a cube root. LiveMath went for the logarithm based x .



Moral: If you don't like LiveMath's decisions then stop watching and tell LiveMath what to do. LiveMath is here to help you do math.



Now It's Your Turn... Follow the directions below to get hands on experience.



1.

Move the x on the right hand side over to the left hand side in the equation

$$6x - 4 = (3x + 2)^2$$

without cases turned on.



2.

With cases turned on.