Our topic is logarithms,
So we can talk about logarithms. Mathematical, now these logarithms were devised by John. John Napier was just Scottish mathematician. What's? For engineers to simplify their calculations, in particular, these logarithms are not multiplications into sums and divisions into subscriptions.
So let us now see what are these logarithms.
So as you see that definition. Stars. Every positive. Just be careful what assumptions and using. Call is exponential. Is equal to. Do you know any such number?
So for example, I have been given a number 4 and I have been given is to deny that right or square. You have been doing. This three square. Any other #27 seven is what you
So we know many such numbers. What we are saying when defining a variable is every positive number can be written in the exponential form as. Easy equal to 86. Concerning certain conditions that is. Should be greater than 0. Cannot be equal to 1. And if these conditions are satisfied. Obviously still. The form is well defined and we call. We will give the primary components we will call. Is the best. This. Please call us please. Then what is another thing? KUB is a number,
So what is the meaning is fixed?
So what will be called? Exist called. This is called. There's a recall, it's. Power off. He wants to. This is called exponential. See your expression. Familiar with. Rate this as. This is a different way of interpreting. This expression is known as. The meaning of profit. Is equal to. You know whatever demonstration I have given?
So I don't want to see how I can write this.
So you can identify or PC equal to 2 squared. That's what this point. How can I write this? What was our place is called? The base?
So too is our base.
So I will rewrite this as the log. What was our being? It was old, is equal to.
Similarly, the next expression will be log. The deepest. It's equal to. This expression. Drop. The debates today. 37
So just.
So this is a different way of writing the same service,
So this information and this information both are.
So in that case I can write. Ex is equal to P is equivalent to say. The dog that you piece of. ***** This is equivalent way of saying this information, but remember this is not always possible. First of all I need this to be a positive number. And we do. We have positive number. I need A to be a positive number and a cannot be equal to 1.
So I have all these conditions. You're not be.
So these conditions should be satisfied. Now let us see the interplay between these points and this particular representation, and this particular representation. Now suppose I want to convert this information into the exponential form. I will give you one. It's just the convention convention that we have adapted. Much simplified. You give you one. We will call this rule at 7.
So I will. Seven starting from. Everything and then
So this is the seven that we have constructed. No. Using this seven rule, we can see this is the base,
So I will write the base first, then comes **. Then comes the number which is.
So this code is 7. We will solve some problems in order to clarify the understanding about.
So you always you will save. You can work any logarithmic expression to the exponential express. And you can always teleport exponential expression into logarithmic expression just to verify all these conditions are satisfied. Now let us come to the point, why do we need all these conditions? What's the question that we can ask this? While this piece should be. Wait?
So I'm gonna give you something examples if I'm dealing with real numbers. However, I am considering the real number. This is equal to 0. What will happen? My fault because. 6. In that case. My 800 is 2X. This particular thing will always hear zero unless it's is 0,
So you will assume it's is not equal to 0.
So this particular thing will always here at 0,
So I cannot have a representation for any belonging to R,
So this is equal to 0 is not allowed.
So for this discussion.
So you can easy equal to minus. Choosing and what will happen if I only want to write

minus two, raise to 6? Find the school square. Which is equal to 4:25 with no problems. This is a real number. They can choose X is equal to half. In that case, what will happen is is wireless two days to half. This is not a real number.

So there is a problem,

So I cannot define by exponential constant whenever. Exist and easier to eliminate the negative. When you are considering is equal to 0, you are considering X is equal to 0. You will go or is zero raised to zero point which is not defined. This also prohibits. The only choice that we are left with.

So these should be greater than. This is the first one. We have put up another condition. What was that condition he cannot be equal to 1. Why he cannot be equal to 1?

So that is another question. Why? You cannot be. Problem with equal to 1 is let us say we can define a couple links.

So I have the equal to 1. My expression is is equal to 126. This is the part. What do you know about one restaurants by tabulates of values? One that is 2, one is always one. One square is always, 112 is always one,

So any numbers you want to raise 200. I think it is always one. You go on the other side one there is 20 is 1. Anything you take this one? He's always. The Queens, what if I if I'm giving this formal expression of the form otherwise to X, then that should always be equal to 1. Which is not the case of my interest. Another expression for any another reason why we have we cannot use for the restraints for any positive any positive real number. Or for that matter, any real number. We cannot express this particular number in the form of 1 raise two things. This is not allowed.

So just wondering,

So it's this white top because we cannot do anything meaningful, we have easy. And the leaves were sent and which is a two year question because once we have fixed the conditions on it then the next question is. Why? Bigger than zero because it might be better than 0. It's for any which is strictly represents 0 will always be better than 0. Mainly understandable, therefore be should be represented.

So we have actually answered all the queries that are raised. All the parties that are for solving this. Finding this expression in order.

So this is the definition of logarithm that is trying to solve some problems. Solve some easier problems based on. What is this from? The first find the weather. Block please. Right now. Let us try to solve them one by one. Check with that we have on this morning. This.

So much strategy will be very standard. We will write this as long to the phase two of 1X.

So this is. Sex.

So we have. Everyday. The police. Praise music. Just using. But I know that any number except for. Increase to 0. Sports. He creates the pages to see increasing words.

So why this? 20 it's easy. It is too soon for anyone. The basic scene for.

So like in the configuration. Let's see what it is here. Brightness. This one. Let's see. Cities. This thing this thing. Question. Thanks. Rate this. Start from the base. Using 7. Chris the question that I would ask is if I do. This is the question. Answer to this question is very easy. By inspection you can guess that. This is why.

So if it 233723 students equal to two place 2-3 therefore. Answer to this question. Based. Second question. It is. Please. Equal to. This is equal. Is the seven. Support. There's nothing. Please speak. Here it is slightly because this is not. Please do something extremely. 7 is not easy to this,

So let us see what is the simplest power to which I can raise both the kids.

So if I want to write 27. That I can write 27. Alright, the question of taking ask is can I write it in terms of players to some? They give my experiences because 27 degrees are 8181, must be 3 raised to four all these games. This information into this promise I can write. I used to. All of these things. I know the laws of advice. If I have to. Played by. It's simply because it is. And he was just saying that. Forex. That simply means. Mornings. It seems. It's must be. Therefore, the solution to this problem? The same word. This is. Wanted to see the last. One by three. Please one by three. Pics yourself. Phase two. What should be the next thing I want to write everything in powers of? Is it possible? Is possible

So whenever I have one on. By laws of indices is equal to. Therefore, the left hand side will make. Seriously? What is the right hand side? Items. Which can be easily seen for the equal to three square multiplied by three, raise to half. This is. It is. Clearly.

Just. Three raised to two plus half, which is 13.3 raised. Three days. Today it is. This is the world.

So therefore. This forces us to say minus X must be. That is equal to point. The odds are the Swiss nowadays. Please.

So this is.

So let us make some observations based on the definition of logarithm. We have already seen. We have seen, by these conditions are required.

So first observation is. I have be equal to 1, which is the exponential logarithmic form of this expression. Phase one this is not really. As it is clear, this number is any being which belongs to real line cannot be generated by using all the results. Only thing that can happen is this one raised to its can be equal to 1.

So one is equal to 1 raise to its for every X belonging to R.

So this has infinitely many solutions. This has infinitely many solutions require rate log. The base one of one. This doesn't make any sense. These observations, what we can say is log the base. Have any meaning that makes me this is not.

So anytime while solving the problems, if you come across such a number where the base is 1, it is antiquated. It is the first that comes to the base is undefined. We should always remember. The base cannot be united, that is the. The third observation. We need everybody on take me. Then you can write this number as a raise to log to the base of. Obviously in this case should satisfy the conditions. And not before. How to prove this is pretty simple? Just check this this particular. It's equal to X6. Then use. Our seventh rule says this. Just curious. I'm not doing anything more than converting. Serious to FCC, equal to the research scheduled X rays to clock. This by using some simple. Let's say three Q is equal to 36. You all know this now. We will put it in a different way. Using this property, what we are saying is 3 release log base. Three of 27 is nothing but 27. Can you verify this log? Base three of 27 is 3,

So three,

So three raise to three is equal to 27. Once they verify property, another quick observation that whatever we have done

So far is also known as an anti log. Suppose. Dog. DOB is equal to X. It's called. You know? Antilog means the opposite of log. Things. The base. Sometimes people may ask for the antilog of the same log. 32 You can easily find out using our seven. This should be equal to. Some people may ask what is antilog? The base of the answer is that means if is raised to the first power, what should be the answer? It is produced. In this case what we are saying is. Or power should I raise to

So that I will get the answer?

So they are. This is the reverse operation. An exponential operation that is 2 raised to five is equal to.

So now let us solve some problems using our basic knowledge of rock and some properties of log that we discussed just now. At least all the problems that tried to solve, and

So in this question I need to find the value of log. And this question again the value of long instrumental. This particular question, which is of the value of this, needs to be figured out and in this question, which is the question of the value of the day needs to be.

So these two are forward versus. Since you're not finding finding the value of underlying variables in this case, the variable is. In this case the variable is. Before you. I don't understand solving problems. We will. What we will do, we will put this to be equal to its and we will try to solve. But here you notice there is some pattern that is

So first we will try to match the pattern and then I will try to solve using or if I don't require anything with like 7.

So first let us see what is the pattern. I want to solve this problem. I need to get hold. We like it. Supposedly right because this is an expression going to Infinity even if I remove one expression here space, they expressed the pattern in the same.

So I will use exploit disk to get hold of the pattern.

So let us see why it's equal. What can you say about this particular? If This is why this also was brewing. Would you agree to that? Nothing but equal. This is also. Considering all of this, express. They're doing all of this. It is a log of this expression and this expression we need.

So it is positive. Therefore my square root is also verified,

So I can rewrite this expression in the. Voice is equal to 3. Rewrite this expression. You know it's usually solved the problem if you conclude this, then you know how to solve

a quadratic equation
So it is voice. Words. It's. By using. Why using? As we have seen their domain. Equal to 0 is not allowed because my log. This. Why? It's. To leave. Why is the tiger?
So why is equal to 0? This is not. Y is equal to three and yes it is allowed because Y is 3. What we have now for solving this particular expression is. Hello. This. Because this is complete. How could you be? You see? Do you know what is locked to the base three of? But if you don't know still, you can use our 700 block phase. Three of three is equal to X. It was the same. Did you say here is this sequel? Saying it is 3 days. It's was being recorded and therefore our arms that was. All that complicated expression. Wants to be equal. 2nd. What was the second question? That's a good question. Was the dog did this? Three of 3 - sqrt 4. Following this, we need to make an important observation. The problem of research first. What is? Before. But another observation before being that I should make this more is a perfect square.
So this essentially 3 plus. This is actually. Are you? This is 1. Also individually assists 3 plus and is not equal to 1.
So let us see what is the value of 3 + 4. Value of. What you are asking is absolutely is. For you. Things. For themselves. Sequel. Raised to its equal to 1. Then you can write one point. One this fire is 20. Was waiting for you. The answer to the question. 4. Face. 2nd. Questions. Minus. The decrease of the.
So I just want to check whether both. Why do you play? This. Minus. If you will not. During the same quarter. 14 is equal to 1. Discussed. Why not? This is the case that whatever is present here. Oops. This observation. We also know what property. Basically. To see. This was. All you can get. Basically. I don't see it. It is equal to 1. This one. Therefore, must be equal to minus one. Dog. Deep space. It's. Grapes I'll be your soldier. What is the person you know trying to help you? Or which? This expression nonsense. Present please. This particular. Three school pics. What do you know about? This is typically of the form. One property we discussed with the theory part this is equal to things. If you want to be more precise. Verify this property.
So how would you verify this property?
So you just put? Morning. Base. Now if you put wire to wire to be equal to substitute that value of point in the original express. Everything is based. Substitute this value of point. This is to write this equal things. Our standard formula. It's just the difference.
So they will be. Now. The situation with the power of it is clearly still quiet. Pics what year is to why? According to your substitution it's nothing but its. Therefore there is to lock the key operations equal to its.
So this verifies this property. If I use this property then I can solve this problem is to instead of being the role of a displayed by.
So what will we get if I use property to disrespect? If I use this property to this expression, I will get. This situation is disappointing. Would be equal to. It's. Waves. This is the case. This is the three eights is equal to minus 9. Is equal to. Tell me why it makes this minus the express. Six is equal to minus 3. Off the face of minus 3. If it is not. There there not be any solution because I am not. Therefore. There is. Minus one. I need to find the value. The connection between. It is. Wait? Minus one. Case. How did I do this? It should be yours because you have used the same 1 by 3 - 1. What what is 1 by three raise 2 - 1? Or using that property, I decide this to be the 3 - 1 - 1, which is 1/3 raise to one is equal to base 12 - 1. This one simplification makeups 0 is equal to minus 4. Zero is equal to square minus and this is nothing. Plus or minus. If you want to be. Do you minus 2? Difference. Easy. Honor has tried to.
So basically what we call this we got. For the value of, now I need to check the validity of the experience.
So if if I put a is equal to two in the above information. What I'm getting is stock. 4 - 1. You see? Is it? Yes, because. To see. Similarly, you can substitute. Is to be equal to? This one. Yes. If I substitute their here, whether the sign is positive or negative, since I am doing this well
So it will be again, all minus. Solve the problems using several properties. Produced.