

Transcript of the Hong Kong Lesson from day 1

- [00:00:04](#) T Very very happy?
- [00:00:08](#) SS Teacher, teacher... we want to switch seats. [In Chinese]
- [00:00:09](#) T Okay, okay. Shh. Stand up please. Good morning class.
- [00:00:16](#) E Good morning, Mr. Chan.
- [00:00:22](#) T Miss Tam, okay,
- [00:00:26](#) T returned this for you.
- [00:00:34](#) T Okay, we will start a new chapter today.
- [00:00:50](#) B [Blackboard: $2x + 4 = x + 6$, $2x + 10 = 2(x + 5)$]
- [00:01:02](#) T On the blackboard, there are two different equations. Okay? Two different equations. It is the equation in X, one unknown only.
- [00:01:11](#) T Therefore, I think that you are familiar with this.
- [00:01:16](#) T I want two of you, okay, to come out and find the solution for these two equations. Any? None of you?
- [00:01:28](#) SS [Laughter]
- [00:01:30](#) T I think that you will like to come out today.
- [00:01:33](#) T Kwan Chi Chung, please. This one. Okay, another beautiful girl, right? Chow Suk Fun.
- [00:01:42](#) SN Yes.
- [00:01:43](#) T Okay. You try to use what you have learned in equations to find the value for X. Okay?
- [00:02:19](#) SS [Laughter]
- [00:02:23](#) T Some of you laughed, it means that you find some mistakes, which one? Equation one or equation two?
- [00:02:31](#) SS Two.
- [00:02:32](#) T Two? Yeung Cho Yee. You try to correct this. Equation two you found some mistakes.
- [00:02:49](#) T Really? [Laughter]
- [00:02:50](#) SS [Laughter]
- [00:02:52](#) T Okay, it should not be four X. Two X on the right-hand side, to the left-hand side, it should be minus two X.
- [00:03:02](#) T Okay? Therefore, left-hand side is zero.
- [00:03:04](#) T And 10, positive 10 on the left-hand side, right-hand side? Negative 10, okay? Therefore, 10 minus 10, it is zero. Okay, this, too.
- [00:03:17](#) T For the first one, you found that the solution is X equals two. What does it mean? X equals two.

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- [00:03:27](#) T If I say that X equals two is the solution, what does it mean? What does it mean?
- [00:03:40](#) T It means, when X equals two, left-hand side will equal right-hand side. Let's check it.
- [00:03:52](#) T Okay, when X equals two, what is the left-hand side? It is two X plus four, okay? Two X plus four.
- [00:04:02](#) T Two, X , plus four, what's the result?
- [00:04:10](#) SS Eight. Eight.
- [00:04:11](#) T Eight. All right? And for the right-hand side, it is X plus six. X , we found that X equals two.
- [00:04:28](#) T Therefore, it is eight again. Are they the same?
- [00:04:32](#) T Yes. Okay? X equals two, then left-hand side right- equals right-hand side. That is the solution for equation one.
- [00:04:33](#) SS Yes.
- [00:04:42](#) T How about the others? Lau Wai Fung, give me one more number for X , other than two. Any one?
- [00:04:57](#) SS Try to use [In Chinese] three [In English].
- [00:04:58](#) T Three. Okay. Let's substitute X equals three. Okay? In equation one. Another value for X .
- [00:05:12](#) T The left-hand side, two X plus four. This time, X equals three. What's the value for the left-hand side?
- [00:05:25](#) SS Ten.
- [00:05:26](#) T You will find that it is 10. But for the right-hand side, X plus six, X plus six.
- [00:05:37](#) SS Nine.
- [00:05:38](#) T Nine. All right? They are not equal. Therefore, we will not say that X equals three is a solution. The solution is X equals two.
- [00:05:52](#) T All right? Of course, you can test for the others. Okay, how about equation two, I get zero equals zero, what does it mean?
- [00:06:04](#) T Do you think that there is no solution? There is no solution. Any one of you say that there is no solution?
- [00:06:14](#) T I can't find X , therefore, no solution. No? Then what will be the solution?
- [00:06:21](#) SN Anything.
- [00:06:23](#) T Sorry? Anything. What do you mean by anything?
- [00:06:27](#) SS Any number.
- [00:06:29](#) T Any number. Okay. Let's check it. We have two and three, okay?
- [00:06:35](#) T Let's try this two firstly. When X equals two. Left-hand side, right-

- hand side.
- [00:06:50](#) T I try to compare these two when X equals two. Left-hand side is two X plus 10. Two X plus 10. Answer?
- [00:07:02](#) SS Fourteen.
- [00:07:06](#) T Fourteen. Right-hand side? Two X plus five. Two plus five. It is?
- [00:07:17](#) SS Fourteen.
- [00:07:18](#) T Fourteen again. Seven times two. Are the two sides equal?
- [00:07:25](#) SS Yes.
- [00:07:26](#) T Yes. Left-hand side equals right-hand side, therefore, even if I can't find the solution, in fact, two, itself, is one of the solutions.
- [00:07:35](#) T How about three? When X equals three. Of course, both the left-hand side and right-hand side, the values will be changed. Okay?
- [00:07:52](#) T On the left-hand side, it is two X plus 10. And on the right-hand side, it is two X plus five. For the left-hand side, it is?
- [00:08:08](#) SS Sixteen.
- [00:08:09](#) T Sixteen. Six plus 10. But for the right-hand side?
- [00:08:15](#) SS Sixteen.
- [00:08:16](#) T It is also 16. This time it is two times eight, is it equal?
- [00:08:22](#) SS Yes.
- [00:08:23](#) T Yes, the left-hand side is still equal to the right-hand side. Not no solution, in fact, at least we have found two. Okay?
- [00:08:34](#) T More than one. How many? From the book, you still have three trials, try to test whether these three are the solutions or not.
- [00:08:48](#) T Page one-four-four. Page one-four-four. In fact, the equation listed is the equation two. Okay?
- [00:08:57](#) T Two X plus 10 equals two brackets, X plus five. Test for the other three solutions of X . Part one, part two and part three.
- [00:09:07](#) T X equals zero, X equals negative one and also X equals negative one over two. Zero, negative integer and negative fraction.
- [00:09:18](#) T Test for the left-hand side and right-hand side, okay? Are they equal? Do it now. Just mark it on your book.
- [00:09:29](#) T And answer the question, whether they are equal or not, for the left-hand side and also the right-hand side.
- [00:10:12](#) T It's better not to use a calculator, okay? But if you use it, just use it to check the answer. It is simple calculation only.
- [00:10:47](#) T Errors?
- [00:11:09](#) T Don't use this, this kind of ball pen, you can't see it clearly.
- [00:11:18](#) T Have all of you finished? Okay, let's check the result. Page one-

- four-four. The three values for X. Uh... okay, Mak Pui Ling. You are nine.
- [00:11:32](#) T Tell me the result, when X equals zero, what will be the left-hand side and right-hand side? Left-hand side?
- [00:11:39](#) SN Equals 10.
- [00:11:40](#) T Equals 10. How about the right-hand side?
- [00:11:42](#) S Equals 10.
- [00:11:43](#) T Then is the left-hand side equal to the right-hand side?
- [00:11:46](#) S Yes.
- [00:11:47](#) T Yes. Okay? We have test the third value for X. When X equals zero, it is still left-hand side equals right-hand side.
- [00:11:57](#) T Okay, how about the fourth trial, when X equals negative one. Sung Wai Ling, okay.
- [00:12:05](#) SN Left-hand side equals eight, right-hand side equals eight.
- [00:12:09](#) T Therefore, do you think that they are equal?
- [00:12:11](#) S Yes.
- [00:12:12](#) T Yes. When X equals negative one, both the left-hand side and right-hand side equal eight. Okay?
- [00:12:20](#) T Therefore, it is still left-hand side equals right-hand side. How about the fifth trial? This time, Lee Shan.
- [00:12:31](#) SN Left-hand side equals nine, right-hand side equals nine.
- [00:12:35](#) T Okay. Therefore, equal. This time, when X equals negative one over two. Both the left-hand side and right-hand side, the result is nine. Okay?
- [00:12:47](#) T Therefore, we have the same result. Left-hand side equals right-hand side. How many solutions now?
- [00:12:56](#) SS Five.
- [00:12:56](#) T Five. Okay? Two on the blackboard with the three in the book, you have five results. Do you think it is only five?
- [00:13:06](#) SS No.
- [00:13:07](#) T No. It has many many. Infinitely, many results. Why? Okay, let's use another trial.
- [00:13:20](#) T This time, this time, we just simplified these two parts. Okay. Left-hand side and right-hand side.
- [00:13:34](#) T In the expressions, you have learned two forms. The one, all the terms add or minus together.
- [00:13:43](#) T It is called? It is called? How do we call them? Add or minus together, it is called?

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- [00:13:59](#) SN Expanded form.
- [00:14:00](#) T Expanded form, okay? Expanded form. You have other ways to express the terms, for example, like that.
- [00:14:15](#) T This time, the terms are times together. Of course we will, we will not call them terms, we should call them-
- [00:14:26](#) T Factors. Therefore, this is called? Factorized form, okay?
- [00:14:41](#) T You may express different expressions in expanded form or factorized form. Now we try to change them, with the same kind of form.
- [00:14:54](#) T Which form, is more easy for you? Expanded form or factorized form?
- [00:15:02](#) SS Factorized form.
- [00:15:04](#) T Some say expanded, some say factorized. In fact, if you want to find expanded form, what are you doing? Just multiplication. Okay?
- [00:15:15](#) T But if you want to find the factorized form, you need to find common factors, or maybe groupings, etcetera. Okay?
- [00:15:24](#) T Therefore, usually, expanded form will be more common, more usual. Just use multiplication, expand it one by one. Okay?
- [00:15:36](#) T We'll try to change both sides, to be expanded form and compare. Left-hand side, is it expanded form?
- [00:15:45](#) SS Yes.
- [00:15:46](#) T It is already expanded form. Two X plus 10.
- [00:15:51](#) T The left-hand side, it is factorized form.
- [00:16:00](#) T What will be the expanded form for the right-hand side?
- [00:16:02](#) SN Two X...
- [00:16:03](#) T It will be?
- [00:16:04](#) SS Two X.
- [00:16:05](#) T Two X.
- [00:16:06](#) SS Plus 10.
- [00:16:07](#) T Plus 10. Constant terms, both are the same, ten. X term, the same, two X. Therefore, will they be always the same?
- [00:16:24](#) SS Yes.
- [00:16:25](#) T Yes. In fact, on both sides, the expressions are exactly the same. Or we say that they are identically the same.
- [00:16:37](#) T Therefore, no matter what's the value of X, it is- you substitute for X, the changes will be the same.
- [00:16:44](#) T Therefore, you will get the same value. Okay? You cannot see it very easily because at first, they appear in different forms.

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- [00:16:57](#) T But if you change them to be the same, same form, then you can see that in fact, they are identically the same. All right?
- [00:17:06](#) T Therefore, not just one solution, you have many many solutions.
- [00:17:14](#) T For this kind of solution, uh, that's- this kind of equation, we will give them a name.
- [00:17:27](#) T Identity. Identity means that they are exactly the same. Okay? Follow me. Identity.
- [00:17:37](#) E Identity.
- [00:17:38](#) T Identity.
- [00:17:40](#) E Identity.
- [00:17:41](#) T Okay? And therefore, for this kind of identity, we will give it a symbol, this time, not just two lines.
- [00:17:56](#) T We use three lines as a symbol. It means both sides are identically the same.
- [00:18:06](#) T We say that, two X plus 10, is identically equal two bracket, two, uh- X plus five. Okay? It's identically equal.
- [00:18:21](#) T They are in fact, exactly the same. Okay? All right, then how to prove identity? Do you think that we try all the values for X?
- [00:18:37](#) T First try, second try, third try, and then, oh, five trials. Then I can conclude they are identity.
- [00:18:45](#) T No, because, that maybe the sixth trial- it fails. All right? Therefore, to prove identity, we will use this method.
- [00:19:00](#) T We will try to change the left-hand side or right-hand side to be expanded form and then compare each term.
- [00:19:04](#) T When all the terms are the same, then we say that it is an identity.
- [00:19:13](#) T But if there are some different terms, then we will not say that it is an identity. Then it will be a normal equation only. Okay?
- [00:19:24](#) T All right, I will give you some examples, who's on duty please clean it.
- [00:19:30](#) T Clean the blackboard please.
- [00:19:39](#) T Can you see the blackboard clearly?
- [00:19:41](#) SS Yes.
- [00:19:43](#) T Yes?
- [00:20:01](#) T Just leave the word identity, okay?
- [00:20:18](#) T Therefore, the difference between identity and equation, equation it may be only one solution, two solutions.
- [00:20:26](#) T But for identity, you have infinite many solutions.
- [00:20:31](#) T It will be always true, okay? For any value of X.

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- [00:20:58](#) B [Blackboard: $5(x - 3) - 3(x - 1) = 2(x - 6)$. $4(2x - 1) - 3(x + 2) = 5(2 - X)$]
- [00:21:16](#) T Okay here, I have two other equations. Of course, now, they are equations only. Okay? We don't know how many solutions for each one.
- [00:21:28](#) T Therefore, they are still equations only. I want to prove that, whether these equations are identities or not.
- [00:21:39](#) T Are they identities? Or are they just equations?
- [00:21:46](#) T The main steps will be, we try to expand the left-hand side and right-hand side, and then compare the terms. Okay?
- [00:21:55](#) T If they are, okay, they are expanded form already. No need to simplify it. But if they are not, simplify it one by one.
- [00:22:04](#) T And then compare the sides. Okay? You can start with the left-hand side or right-hand side. No matter.
- [00:22:13](#) T Okay? It doesn't matter. Left-hand side... expand it. It should be...
- [00:22:25](#) SS Five X.
- [00:22:27](#) T Five X.
- [00:22:28](#) SS Minus 15.
- [00:22:30](#) T Minus 15.
- [00:22:31](#) SS Minus three X.
- [00:22:34](#) T Minus three X and...
- [00:22:35](#) SS Plus three.
- [00:22:36](#) T Plus three. Therefore, how many X?
- [00:22:42](#) SS Two X.
- [00:22:43](#) T Two X only. And the constant term?
- [00:22:46](#) SS Minus 12.
- [00:22:48](#) T Minus 12. Okay? Expanded form. Simplify that expanded form. And for the right-hand side, after expansion, it is two X.
- [00:23:05](#) SS Two X. Minus 12.
- [00:23:10](#) T Are they equal?
- [00:23:11](#) SS Yes.
- [00:23:17](#) T All right? They are equal. Therefore, do you think that it is an identity? Or an equation?
- [00:23:24](#) SS Identity.
- [00:23:26](#) T Identity. Therefore, you can write down the result like that. Five X minus three minus three X minus one.
- [00:23:37](#) T Two X minus six bracket. With this symbol. It's identical to the left-

- uh, right-hand side.
- [00:23:50](#) T Okay? Or you can write it as a written form. It is an identity. Okay? But of course it is not so clear, to just write down it is.
- [00:24:01](#) T Therefore, I think this is better. With the symbol, one, two, three, three lines. Okay, how about the second one?
- [00:24:21](#) T How about some helper? So Wing Chung. You need to practice some more about your handwriting.
- [00:24:35](#) T Try to simplify the left-hand side and right-hand side.
- [00:24:49](#) T How about the bracket? Are you too nervous?
- [00:24:54](#) SN Yes.
- [00:25:12](#) T He is very careful.
- [00:25:14](#) SS [Laughter]
- [00:25:16](#) T Very very careful. [Laughter] How about the right-hand side? Is he correct for the left-hand side?
- [00:25:29](#) SS Yes.
- [00:25:30](#) T Yes.
- [00:25:39](#) T Okay, thank you. Firstly, is he correct for the simplification in the left-hand side and right-hand side?
- [00:25:50](#) SS Yes.
- [00:25:51](#) T Okay. After simplification, you have two expanded forms, are they equal? No.
- [00:26:01](#) T Although it is the same five X, but one is positive, another is negative. Okay?
- [00:26:08](#) T Even the 10 is the same, it is not identically equal. But of course now, it is not the same, negative 10, positive 10, okay?
- [00:26:17](#) T Therefore, we can say that, the left-hand side is not equal to the right-hand side.
- [00:26:26](#) T Then can we say that it is an identity?
- [00:26:28](#) SS No.
- [00:26:29](#) T No. Then your answer, you may just write down. Or you complete this, okay? Uh, write down the whole equation.
- [00:26:47](#) T We have the conclusion, this equation is not an identity. Okay? If it is not identity, we can still call it an equation. Okay?
- [00:27:00](#) T It is only an equation, not an identity. If it is an equation, it may be one solution only. Because it is one unknown, one equation.
- [00:27:11](#) T Therefore, you may find the solution for it. Just one. But for identity, you have, in fact, infinite many solutions. Okay?
- [00:27:22](#) T It will be satisfied for all the values of X for identities. Understand?

- Know the difference between identity and equation.
- [00:27:34](#) T And for identity, in between the two sides, you can use a new symbol with three lines. And we read it as, is identical to.
- [00:27:46](#) T Or you can say that they are identically equal. Okay? You have some class practices here. Page one-four-seven, page one-four-seven.
- [00:28:04](#) T Seven equations are given to you. Okay? Seven equations are given to you. Some of them are already in the expanded form.
- [00:28:13](#) T But some are still in factorized form. Use the method, okay? Use the method listed on the blackboard.
- [00:28:22](#) T Tell whether they are identities or not. Understand? Try to prove whether they are identities or not.
- [00:28:32](#) T Number one to number seven. Those simple ones, just write down the answers in the book.
- [00:28:38](#) T But if you need to simplify it, for that kind of equation, please do your work on your class workbook.
- [00:28:48](#) T All right? Class practice number one to number seven. Any more questions? Number one to number seven. Please complete that.
- [00:29:27](#) T If you need to expand it, simplify it, please do it in your classwork book. Don't just write yes or no.
- [00:29:39](#) T Just in the case, both sides are in expanded form, you can completely-
- [00:29:44](#) T Uh, you can directly compare it, then you can write down the answer.
- [00:29:49](#) T But if they are not exactly the same, in different forms, in your classwork, show some steps.
- [00:29:57](#) T Okay? How to simplify the left-hand side, how to simplify the right-hand side. And then compare the terms. Okay?
- [00:30:05](#) T Remember, before the conclusion, write down the result. Whether the left-hand side or right-hand side are equal. Okay?
- [00:30:14](#) T Before your conclusion, you should have the result. Left-hand side equals, or does not equal right-hand side.
- [00:30:27](#) SN (inaudible)
- [00:30:28](#) T Classwork book.
- [00:30:43](#) O [Bell]
- [00:30:55](#) T Is there any question? Write down whether it is left-hand side or right-hand side. Okay?
- [00:31:09](#) T Stop for a while. After the expansion, remember, you must tell whether they are equal- or not. And then your conclusion.

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- [00:31:22](#) T Okay? If the left-hand side equals the right-hand side, then it is an identity.
- [00:31:28](#) T But if they are not equal. Then this one, or you can simply say that, it is not an identity.
- [00:31:42](#) T All right? Okay, finish the work at home and we will check it tomorrow. Stand up please.
- [00:31:53](#) T Bye class.
- [00:31:55](#) E Goodbye Mr. Chan.
- [00:31:58](#) T Yes. And please say thanks to Miss Tam.
- [00:32:01](#) T [Laughter]

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