00:00:05.400 --> 00:00:06.900
All right, this video is

00:00:06.900 --> 00:00:07.800
about factoring polynomials.

00:00:07.800 --> 00:00:11.320
To have an X squared term in them.

00:00:11.320 --> 00:00:13.427
But this X squared has on it

00:00:13.427 --> 00:00:14.650
something like, you know,

00:00:14.650 --> 00:00:17.550
like a four or a two or five, right?

00:00:17.550 --> 00:00:18.700
Instead of just a one,

00:00:18.700 --> 00:00:20.059
which is what we've done up to this point.

00:00:20.060 --> 00:00:21.278
This is like four X squared.

00:00:21.280 --> 00:00:22.063
So for example,

00:00:22.063 --> 00:00:23.629
we want to take this polynomial.

00:00:25.970 --> 00:00:28.172
And we want to write it as a product.

00:00:28.172 --> 00:00:30.825
So we want to find stuff that goes in

00:00:30.825 --> 00:00:33.201
here so that when I multiply this all

00:00:33.275 --> 00:00:35.576
out I get this polynomial here and

00:00:35.576 --> 00:00:38.104
we're going to use the area model here.

00:00:38.110 --> 00:00:39.806
So I want to think of this as

00:00:39.806 --> 00:00:41.770
like a link and this is a width.

00:00:41.770 --> 00:00:43.186
And we're just going to kind

00:00:43.186 --> 00:00:44.759
of guess our way through it.

00:00:44.760 --> 00:00:47.360
Which is, it's really going to involve a

00:00:47.360 --> 00:00:49.407
certain amount of just trial and error

00:00:49.407 --> 00:00:51.750
and just kind of like puzzling it out.

00:00:51.750 --> 00:00:55.019
So when we set this area up,

00:00:55.020 --> 00:00:56.346
these X squared terms, they're only

00:00:56.346 --> 00:00:57.966
going to come from one spot, right?

00:00:57.966 --> 00:01:00.494
So we're going to put this guy here.

00:01:00.500 --> 00:01:02.225
And this constant term that's

00:01:02.225 --> 00:01:04.609
only going to come from one spot.

00:01:04.610 --> 00:01:06.941
But this 4X is going to be

00:01:06.941 --> 00:01:08.740
these two added together.

00:01:08.740 --> 00:01:11.470
So now what I need to do is I need

00:01:11.560 --> 00:01:14.380
to fill in these little dimensions.

00:01:14.380 --> 00:01:15.647
In such a way that the area

00:01:15.647 --> 00:01:16.730
here is 4 X squared.

00:01:16.730 --> 00:01:19.131
So I need numbers here that multiply

00:01:19.131 --> 00:01:21.697
to four so I could have one and

00:01:21.697 --> 00:01:23.922
four or two and two and any numbers

00:01:23.922 --> 00:01:25.446
here and here that multiply to

00:01:25.446 --> 00:01:26.963
negative three so I could have one

00:01:26.963 --> 00:01:29.720
and three or three and one like.

00:01:29.720 --> 00:01:31.141
Just switch the order and one of

00:01:31.141 --> 00:01:32.400
those numbers has to be negative.

00:01:32.400 --> 00:01:33.960
So let's start with this one.

00:01:33.960 --> 00:01:37.656
I'm gonna put here for X and here

00:01:37.656 --> 00:01:40.720
X SO4X times X is X4 X squared.

00:01:40.720 --> 00:01:41.798
And then I'm going to put here.

00:01:41.800 --> 00:01:43.530
Let's just put here 3.

00:01:43.530 --> 00:01:45.609
And here's one.

00:01:45.610 --> 00:01:47.780
So we need these numbers to multiply

00:01:47.780 --> 00:01:48.710
to negative three.

00:01:48.710 --> 00:01:50.678
One of them is going to be negative,

00:01:50.680 --> 00:01:51.802
so let's see.

00:01:51.802 --> 00:01:53.806
So like, let's hear I'm going

00:01:53.806 --> 00:01:56.230
to get a 3X maybe a negative 3X.

00:01:56.230 --> 00:01:59.360
And here I'm going to get 4X.

00:01:59.360 --> 00:02:00.336
And you can see.

00:02:00.336 --> 00:02:03.081
So like when I when I put the the minus

00:02:03.081 --> 00:02:05.610
signs on three or on negative one right,

00:02:05.610 --> 00:02:08.028
there's no way for these two.

00:02:08.030 --> 00:02:09.410
To work out to 4X,

00:02:09.410 --> 00:02:10.670
this is just not going to workout.

00:02:10.670 --> 00:02:12.313
So like I could put here negative

00:02:12.313 --> 00:02:14.854
one and then this is negative and

00:02:14.854 --> 00:02:17.117
then here I get a negative X so

00:02:17.120 --> 00:02:19.226
this didn't work and that's fine.

00:02:19.230 --> 00:02:20.110
We just try it again.

00:02:20.110 --> 00:02:23.910
So like let's go over here and put here, OK?

00:02:23.910 --> 00:02:27.410
Uhm? By four X squared.

00:02:27.410 --> 00:02:29.110
And my negative 3.

00:02:29.110 --> 00:02:32.132
And I'm going to put here X and

00:02:32.132 --> 00:02:34.036
4X again and this time it just

00:02:34.036 --> 00:02:36.342
switch these two around here 01.

00:02:36.342 --> 00:02:38.586
And here are three.

00:02:38.590 --> 00:02:38.753
OK,

00:02:38.753 --> 00:02:39.894
and then maybe this work and again

00:02:39.894 --> 00:02:41.408
one of these is going to be negative

00:02:41.408 --> 00:02:42.430
because of the negative three.

00:02:42.430 --> 00:02:45.658
So here I'm getting X and here

00:02:45.658 --> 00:02:47.560
I'm getting 12X.

00:02:47.560 --> 00:02:48.580
So this is definitely not going

00:02:48.580 --> 00:02:49.260
to work out right?

00:02:49.260 --> 00:02:51.003
'cause there's no way for me to

00:02:51.003 --> 00:02:53.036
take 12X and X and somehow a set

00:02:53.036 --> 00:02:54.598
up like a difference of those

00:02:54.598 --> 00:02:56.408
things and get this 4X.

00:02:56.408 --> 00:02:59.282
There's some here adding these together

00:02:59.282 --> 00:03:02.725
even with a minus sign on one of these.

00:03:02.730 --> 00:03:06.466
Uhm? It's not going to give me a 4X,

00:03:06.470 --> 00:03:08.246
so I've really here sort of

00:03:08.246 --> 00:03:10.080
ruled out this one and four,

00:03:10.080 --> 00:03:13.340
and I need to try the two and two. And.

00:03:17.800 --> 00:03:22.114
Let's see. So here I have my 4X squared.

00:03:22.120 --> 00:03:25.072
Right, and again these X squared terms are

00:03:25.072 --> 00:03:28.184
just going to come from this one upper left.

00:03:28.190 --> 00:03:29.966
I'm wondering if it's left or right for

00:03:29.966 --> 00:03:31.646
you from this corner and this constant

00:03:31.646 --> 00:03:33.670
is going to come from from this corner.

00:03:33.670 --> 00:03:35.750
So now I'm going to try the two and two,

00:03:35.750 --> 00:03:41.120
so I put here 2X and here. 2X.

00:03:41.120 --> 00:03:44.218
And then here I put 3. And here one.

00:03:44.218 --> 00:03:47.769
And then this is going to work out to a 6X.

00:03:47.770 --> 00:03:49.210
This is a 2X.

00:03:49.210 --> 00:03:51.915
Right and then I need to choose

00:03:51.915 --> 00:03:54.310
the sign on these two again.

00:03:54.310 --> 00:03:55.750
One of them is negative because of this

00:03:55.750 --> 00:03:58.477
negative three, so I need it to be that.

00:03:58.480 --> 00:04:02.520
One of these is negative and they add up to

00:04:02.520 --> 00:04:04.670
this 4X, so I want this one to be negative,

00:04:04.670 --> 00:04:06.356
so I put here in negative.

00:04:06.360 --> 00:04:07.154
And negative.

00:04:07.154 --> 00:04:09.536
Right, so 2X times negative one

00:04:09.536 --> 00:04:11.940
is negative X and now sure enough,

00:04:11.940 --> 00:04:14.730
when I add these guys give me this 4X.

00:04:14.730 --> 00:04:17.210
So what it means is this thing which

00:04:17.210 --> 00:04:19.493
is the complete area here, right?

00:04:19.493 --> 00:04:21.197
It's four X ^2 + 6 X minus

00:04:21.197 --> 00:04:24.086
two X - 3 is two X + 3.

00:04:27.510 --> 00:04:31.279
Times two X - 1 and that's it.

00:04:31.279 --> 00:04:33.251
That's factoring with ax

00:04:33.251 --> 00:04:34.202
squared geometrically,

00:04:34.202 --> 00:04:36.914
just guessing and in the next

00:04:36.914 --> 00:04:38.765
video we're going to look at

00:04:38.765 --> 00:04:40.160
a little bit more algorithmic

00:04:40.219 --> 00:04:41.669
approach so that we're not.

00:04:41.670 --> 00:04:43.598
I have to rely on guessing every time.