00:00:08.110 --> 00:00:11.068
So we're going to talk about

00:00:11.070 --> 00:00:13.850
powers to powers, so exponents

00:00:13.850 --> 00:00:16.690
that are raised to another power,

00:00:16.690 --> 00:00:19.518
so powers of exponents.

00:00:27.780 --> 00:00:30.190
So we're talking about looking

00:00:30.190 --> 00:00:33.510
at things that look like this X

00:00:33.510 --> 00:00:37.970
squared raised to the third power.

00:00:37.970 --> 00:00:40.023
So if we write out what this is, right?

00:00:40.023 --> 00:00:42.494
So remember, this third power means to

00:00:42.494 --> 00:00:45.062
repeat everything inside the (3 times,

00:00:45.062 --> 00:00:53.760
so this would be X ^2 * X ^2 * X ^2,

00:00:53.760 --> 00:00:55.902
and then for each of these X

00:00:55.902 --> 00:00:58.008
squared's I can break them down.

00:00:58.010 --> 00:01:01.612
So X squared means to repeat X2 times.

00:01:01.612 --> 00:01:04.967
So this first one here.

00:01:04.970 --> 00:01:07.870
Becomes X * X.

00:01:07.870 --> 00:01:13.198
This second one here becomes X * X.

00:01:13.198 --> 00:01:18.974
And then this third one here becomes X * X.

00:01:18.974 --> 00:01:22.446
So if I breakdown each one of those

00:01:22.446 --> 00:01:24.740
individually, that's what I end up getting.

00:01:24.740 --> 00:01:26.908
And so now if I count up how

00:01:26.908 --> 00:01:28.350
many axes I have, I have

00:01:31.640 --> 00:01:37.100
123456, so this gives me X to the 6th power.

00:01:37.100 --> 00:01:38.815
So when we have powers to powers,

00:01:38.820 --> 00:01:42.033
all we're doing is, it's just extra

00:01:42.033 --> 00:01:43.710
multiplication that's going on.

00:01:43.710 --> 00:01:46.260
So if we try to look at how we can

00:01:46.339 --> 00:01:49.326
relate 2-3 and sit to the six over here,

00:01:49.330 --> 00:01:53.698
well 2 * 3 would give me the six and

00:01:53.698 --> 00:01:56.562
that is exactly what the general rule is.

00:01:56.570 --> 00:01:59.900
So the general power rule.

00:02:02.230 --> 00:02:03.520
For exponents.

00:02:08.010 --> 00:02:13.278
Is that X to the A?

00:02:13.280 --> 00:02:16.010
Raised to the B power is going

00:02:16.010 --> 00:02:19.200
to become X to the AB power,

00:02:19.200 --> 00:02:23.310
so we'll do an example here.

00:02:23.310 --> 00:02:28.529
So for example. If I had X to the 7th.

00:02:28.529 --> 00:02:31.140
To the 11th power again you could

00:02:31.232 --> 00:02:33.398
write this all out, but that's a

00:02:33.398 --> 00:02:35.130
lot of writing out of X is right.

00:02:35.130 --> 00:02:38.244
It's probably too much writing out of X is,

00:02:38.250 --> 00:02:41.139
so this is just going to become X to

00:02:41.139 --> 00:02:45.946
the 7 * 11 or X to the 77th power,

00:02:45.946 --> 00:02:48.360
so that would be a lot of X is

00:02:48.360 --> 00:02:51.820
if we were writing it out, but.

00:02:51.820 --> 00:02:53.000
Since we have this rule,

00:02:53.000 --> 00:02:56.395
that kind of helps us and it also

00:02:56.395 --> 00:03:01.119
extends if I had say X ^2 y ^3

00:03:01.120 --> 00:03:05.390
say all raised to the 10th power.

00:03:05.390 --> 00:03:07.598
Since there's no plus or minus in here,

00:03:07.600 --> 00:03:09.189
since the only thing that's going on

00:03:09.189 --> 00:03:10.920
between here is multiplication, right?

00:03:10.920 --> 00:03:12.280
That symbol wasn't there,

00:03:12.280 --> 00:03:13.220
but when it's not there,

00:03:13.220 --> 00:03:14.471
it means multiplication.

00:03:14.471 --> 00:03:16.139
We can distribute this,

00:03:16.140 --> 00:03:17.472
we cannot distribute it.

00:03:17.472 --> 00:03:20.000
If it was a plus or minus.

00:03:20.000 --> 00:03:21.698
But with the multiplication we can,

00:03:21.700 --> 00:03:23.884
so this would just become X to

00:03:23.884 --> 00:03:28.911
the 2 * 10 Y to the 3 * 10.

00:03:28.911 --> 00:03:35.290
Or X to the 20th Y to the 30th.

00:03:37.500 --> 00:03:38.928
So that's all there really is

00:03:38.928 --> 00:03:40.450
to the powers of exponents.