00:00:04.650 --> 00:00:07.770

OK, this video is on factoring by grouping

00:00:07.770 --> 00:00:10.977

and factor by grouping works when you have.

00:00:10.980 --> 00:00:12.936

You have four terms like this,

00:00:12.940 --> 00:00:14.548

so terms remember are things that

00:00:14.548 --> 00:00:16.409

are separated by plus or minus signs.

00:00:16.410 --> 00:00:18.462

So I have four terms there and

00:00:18.462 --> 00:00:20.716

what you do in factor by grouping

00:00:20.716 --> 00:00:22.800

is like divide and conquer.

00:00:22.800 --> 00:00:25.608

So you're going to take the 1st 2.

00:00:25.610 --> 00:00:26.783

And factor those,

00:00:26.783 --> 00:00:30.060
and then you're going to take the 2nd 2.

00:00:30.060 --> 00:00:32.881
And factor those and if factor by

00:00:32.881 --> 00:00:35.799
grouping works and it won't always work,

00:00:35.800 --> 00:00:37.360
although in this class it's

00:00:37.360 --> 00:00:39.500
typically going to work if it works,

00:00:39.500 --> 00:00:41.540
what you'll get are two terms,

00:00:41.540 --> 00:00:42.852
more complicated terms and

00:00:42.852 --> 00:00:44.492
they'll have a common factor,

00:00:44.500 --> 00:00:46.453
and then you'll factor those so it's

00:00:46.453 --> 00:00:48.439

like factor these two factor those two,

00:00:48.440 --> 00:00:50.864

you get 2 new things. Factor those guys.

00:00:50.864 --> 00:00:52.496

And everything is factored.

00:00:52.500 --> 00:00:56.830

So let's do it. What we're gonna get here?

00:00:56.830 --> 00:00:58.258

The greatest common factor

00:00:58.258 --> 00:00:59.686

there is X squared,

00:00:59.690 --> 00:01:02.666

so I'm going to write down X ^2.

00:01:02.670 --> 00:01:04.950

And then what's left if I factor X

00:01:04.950 --> 00:01:08.210

squared off here is X right X ^2?

00:01:08.210 --> 00:01:10.397

* X is X ^3 and here just two?

00:01:13.200 --> 00:01:15.297

So I factored those first two and then I'm

00:01:15.297 --> 00:01:17.237

going to forget about that for a second.

00:01:17.240 --> 00:01:19.568

I'm going to factor those two.

00:01:19.570 --> 00:01:22.265

OK, what's the greatest common factor here?

00:01:22.270 --> 00:01:24.782

It's just going to be 3, right?

00:01:24.782 --> 00:01:29.750

And when I when I factor off that three.

00:01:29.750 --> 00:01:31.794

In fact, by grouping you always want

00:01:31.794 --> 00:01:34.138

to keep the sign of this term here,

00:01:34.140 --> 00:01:37.044

so I'm going to put here a minus.

00:01:37.050 --> 00:01:39.450

And a factor of three and then OK.

00:01:39.450 --> 00:01:41.109

So what am I going to leave?

00:01:41.110 --> 00:01:43.250

There is just X.

00:01:43.250 --> 00:01:47.504

Negative 3 * X is negative 3X and then

00:01:47.504 --> 00:01:48.872

here I need to be careful, right?

00:01:48.872 --> 00:01:51.044

If I factor that negative three

00:01:51.044 --> 00:01:53.050

off of really off of negative six,

00:01:53.050 --> 00:01:56.780

what I'm getting is +2.

00:01:56.780 --> 00:01:58.138

Right and then we can check it.

00:01:58.140 --> 00:02:00.364

So like if I were to multiply that

00:02:00.364 --> 00:02:02.070

back through, I'd have negative 3 *

00:02:02.070 --> 00:02:04.924
X which is minus 3X negative 3 * 2,

00:02:04.924 --> 00:02:06.060
which is negative 6.

00:02:06.060 --> 00:02:08.418
So I'm all set so OK.

00:02:08.420 --> 00:02:09.988
I factored those two.

00:02:09.988 --> 00:02:12.340
I factored those two and then

00:02:12.419 --> 00:02:13.647
this gives Me 2.

00:02:13.650 --> 00:02:14.574
Two terms right.

00:02:14.574 --> 00:02:15.190
So remember,

00:02:15.190 --> 00:02:16.709
terms are separated by plus or minus.

00:02:16.710 --> 00:02:18.250

So sort of big picture.

00:02:18.250 --> 00:02:20.784

I've got this thing minus this thing,

00:02:20.790 --> 00:02:22.806

so there are two terms there.

00:02:22.810 --> 00:02:24.138

So what I'm going to do is I'm

00:02:24.138 --> 00:02:25.288

going to factor those guys.

00:02:28.720 --> 00:02:31.180

And what's the greatest common factor?

00:02:31.180 --> 00:02:32.428

Well, in this case,

00:02:32.428 --> 00:02:34.500

greatest common factor is X + 2.

00:02:34.500 --> 00:02:36.460

Remember everything in pyrennes here?

00:02:36.460 --> 00:02:37.756

That's one number, right?

00:02:37.756 --> 00:02:40.701

So that number X + 2 that's appearing

00:02:40.701 --> 00:02:43.016

in both of these expressions,

00:02:43.020 --> 00:02:44.496

and so it's a common factor,

00:02:44.500 --> 00:02:46.165

so I'm going to factor off X + 2.

00:02:50.110 --> 00:02:51.230

And then where does that leave me here?

00:02:51.230 --> 00:02:52.574

Here it just leaves me X ^2.

00:02:54.710 --> 00:02:58.086

And then here it leaves me minus 3.

00:02:58.090 --> 00:02:59.410

And that's it. Remember factoring

00:02:59.410 --> 00:03:01.190

it is writing as a product,

00:03:01.190 --> 00:03:04.158

and I took this big expression up here.

00:03:04.160 --> 00:03:07.301
I wrote it as a product that can be

00:03:07.301 --> 00:03:09.443
surprisingly useful at times and we

00:03:09.443 --> 00:03:11.774
did it by grouping and grouping again.

00:03:11.780 --> 00:03:15.150
All you do is factor the first two factor,

00:03:15.150 --> 00:03:18.020
the 2nd 2, then you've got 2.

00:03:18.020 --> 00:03:20.160
Terms, hopefully those things

00:03:20.160 --> 00:03:22.300
have a common factor.

00:03:22.300 --> 00:03:24.300
Factor off that common factor

00:03:24.300 --> 00:03:25.144
and you're all done.

00:03:25.144 --> 00:03:25.988

That's factor by grouping.