

00:00:06.080 --> 00:00:08.000

This video is an explanation of

00:00:08.000 --> 00:00:10.418

why it is the AC method work.

00:00:10.420 --> 00:00:11.448

This is optional material.

00:00:11.448 --> 00:00:12.733

This is just sort of,

00:00:12.740 --> 00:00:15.380

you know in my mind mathematics

00:00:15.380 --> 00:00:17.508

shouldn't involve like abstract magic,

00:00:17.508 --> 00:00:19.932

it should be explainable in terms

00:00:19.932 --> 00:00:22.108

of things that we understand.

00:00:22.110 --> 00:00:24.036

So you're not going to be tested on this,

00:00:24.040 --> 00:00:25.282

but if you're bothered by the

00:00:25.282 --> 00:00:26.639

AC method and you think like,

00:00:26.640 --> 00:00:29.080

well, why would that work?

00:00:29.080 --> 00:00:30.680

Hopefully this will explain it,

00:00:30.680 --> 00:00:32.894

so AC method is for factoring

00:00:32.894 --> 00:00:34.770

polynomials that look like this.

00:00:40.560 --> 00:00:42.568

Right and what we do in the AC

00:00:42.568 --> 00:00:44.396

method is we multiply A and C,

00:00:44.400 --> 00:00:48.416

hence the name and we find new numbers

00:00:48.416 --> 00:00:51.010

that multiply to AC and add to be and

00:00:51.010 --> 00:00:53.435

then what we do is we split B into those

00:00:53.435 --> 00:00:55.420

numbers and then we factor by grouping

00:00:55.420 --> 00:00:57.429

and everything works out and at the

00:00:57.429 --> 00:00:59.155

end what we have is something like this.

00:00:59.160 --> 00:01:04.977

We have like AP. $X + Q$.

00:01:04.980 --> 00:01:08.229

Times in RX. Plus South.

00:01:08.229 --> 00:01:11.607

Right, we're going to get something

00:01:11.607 --> 00:01:14.389

like that after we factor.

00:01:14.390 --> 00:01:15.950

And what I want to do here is

00:01:15.950 --> 00:01:17.326

just work backwards from this

00:01:17.326 --> 00:01:18.886

finished product and see well,

00:01:18.890 --> 00:01:20.894

what properties should PQRS have in

00:01:20.894 --> 00:01:23.548

order for us to be able to do this.

00:01:23.550 --> 00:01:24.486

So working backwards,

00:01:24.486 --> 00:01:27.266

what I'm going to do is. Foil that out.

00:01:27.266 --> 00:01:29.078

So first I'm going to have.

00:01:29.080 --> 00:01:30.739

I'm going to have the first terms,

00:01:30.740 --> 00:01:35.306

so that's $P \cdot R \cdot X^2$, right?

00:01:35.306 --> 00:01:37.236

I'll have the outer terms.

00:01:41.170 --> 00:01:42.586

And I'll have the inner terms.

00:01:46.040 --> 00:01:47.228

And then I'll have the last.

00:01:51.470 --> 00:01:53.309

And here we can see oh, look so right.

00:01:53.309 --> 00:01:55.554

These have a common factor of X so

00:01:55.554 --> 00:01:57.423

I can simplify this a little bit.

00:01:57.430 --> 00:01:58.606

I'm going to leave a little bit of

00:01:58.606 --> 00:01:59.790

a gap here, and I'm going to write.

00:02:02.800 --> 00:02:05.344

PRX squared and then OK so when I

00:02:05.344 --> 00:02:07.960

factor that X off what does that leave?

00:02:07.960 --> 00:02:13.610

It leaves me PS. Plus ker.

00:02:13.610 --> 00:02:20.070

Times X and then here plus QS.

00:02:20.070 --> 00:02:22.630

Right, so again, all I've done is say,

00:02:22.630 --> 00:02:24.526

well, OK, I want to factor this guy.

00:02:24.530 --> 00:02:25.666

This is what it's going to look like.

00:02:25.670 --> 00:02:26.936

Once it's factored.

00:02:26.936 --> 00:02:29.046

Let's now foil this out.

00:02:29.050 --> 00:02:30.632

Kind of collect like terms and here

00:02:30.632 --> 00:02:32.648

we are and then we can compare right?

00:02:32.650 --> 00:02:36.542

So a needs to be $P * R$ and C needs

00:02:36.542 --> 00:02:40.058

to be Q times South and B of all

00:02:40.058 --> 00:02:42.640

things needs to be PS plus QR.

00:02:42.640 --> 00:02:44.576

So let's think about it a little bit.

00:02:44.580 --> 00:02:49.340

What's a * C? So a?

00:02:49.340 --> 00:02:53.528

Times C is going to be.

00:02:53.530 --> 00:02:54.420

I'm going to get in

00:02:54.420 --> 00:02:55.310

trouble with my colors so.

00:02:58.850 --> 00:02:59.907

I'm going to write it like this.

00:02:59.910 --> 00:03:01.940

It's going to be PS.

00:03:06.330 --> 00:03:09.130

Times. QR.

00:03:11.620 --> 00:03:13.126

Right, let's just let's just stop

00:03:13.126 --> 00:03:14.840

and look at that for a second.

00:03:14.840 --> 00:03:20.911

A is, PRC is so a * C is P * r * Q * S

00:03:20.911 --> 00:03:24.000

and here is P * r * Q * S and I've just

00:03:24.000 --> 00:03:26.109

written them in these funny colors.

00:03:26.110 --> 00:03:31.480

So now let's look and see what is BB is PS.

00:03:31.480 --> 00:03:33.094

Plus QR, right?

00:03:33.094 --> 00:03:36.406

And so if I can find these numbers

00:03:36.406 --> 00:03:38.950

and those numbers are PS.

00:03:41.000 --> 00:03:46.180

And QR that multiply to AC right?

00:03:46.180 --> 00:03:47.636

And add to be.

00:03:47.636 --> 00:03:50.330

Then I can split B in two.

00:03:50.330 --> 00:03:52.936

As PS&QR and then just

00:03:52.936 --> 00:03:54.268

factor down from there.

00:03:54.270 --> 00:03:56.286

So that's why the AC method works.

00:03:56.290 --> 00:03:58.047

I need to find this number here

00:03:58.047 --> 00:04:00.058

in sort of bluish green and you

00:04:00.058 --> 00:04:02.153

need to find this number here and

00:04:02.153 --> 00:04:04.450

sort of purple E and then I need.

00:04:04.450 --> 00:04:05.790

Those two numbers again,

00:04:05.790 --> 00:04:07.788

they've gotta multiply to AC and add to be.

00:04:07.790 --> 00:04:09.558

That's the whole idea.

NOTE Confidence: 0.30510111

73f2d37f-47d3-4a9d-a043-15528cd380fb

00:04:09.558 --> 00:04:11.326

So it's very abstract.

00:04:11.330 --> 00:04:12.485

There's really not like a

00:04:12.485 --> 00:04:13.640

single number written up here,

00:04:13.640 --> 00:04:15.830

except for that one little tool

00:04:15.830 --> 00:04:17.675

that keeps showing up right?

00:04:17.675 --> 00:04:19.985

But it's also not beyond you,

00:04:19.990 --> 00:04:21.230

and so if you're interested

00:04:21.230 --> 00:04:22.470

in this kind of thing,

00:04:22.470 --> 00:04:23.370

you know, take some time,

00:04:23.370 --> 00:04:25.377

take take 5 or 10 minutes out of your

00:04:25.377 --> 00:04:27.309

life and just sort of recreate this,

00:04:27.310 --> 00:04:27.482

right?

00:04:27.482 --> 00:04:28.514

Make it your own and then

00:04:28.514 --> 00:04:29.470

you can really understand.

00:04:29.470 --> 00:04:31.080

Why does AC method work?