Let's look at going between representations.

We'll start in i, j, k representation going to the magnitude and angle representation.

So if we have our vector, the arbitrary vector could be written as Ax i hat plus Ay j hat.

In this particular case, we're given a vector minus 2i hat plus 3 hat.

And we'd like to go to the magnitude and angle representation.

So, first of all, let's draw it out on our grid like this.

And let's find the magnitude.

So the magnitude we can find through the Pythagorean theorem.

It's just the square root of the x-component squared plus the y-component squared.

And now we can find the angle.

The angle, the tangent of the angle, is just equal to the y-component divided by the x-component like this.

And so in this way, we can solve for the angle.

Now, let's practice going back the other way.

If we're given a vector whose magnitude is 2 and whose angle from the x-axis is 30 degrees, like this one here, then the x-component is just the magnitude times the cosine of the angle, so 2 times the cosine of 30.

And the y-component is just the magnitude times the sine of the angle, so 2 times the sine of 30.