

Module 11: Constructions

Topic 1 Content: Constructing a Line Segment Congruent to a Given Line Segment Transcript

Hi guys. Welcome to geometry. In this topic, you're going to learn how to use the compass and the straight edge to construct a line segment congruent to a given line segment. Now your knowledge of circles is going to come in handy during this topic. You ready to get started? Let's go.

Look what we have here, we are given a line segment, and what we're going to do, is we're going to construct a line segment congruent to this line segment. Now, you'll typically normally be given that line segment at first, and if you're not already given a ray that extends longer than the length of your segment, then you'll just want to go ahead and sketch a ray that extends longer than the length of your segment. Okay? This is how you'll start this one out.

You're going to want to line up your compass, and you're going to want to set the width equal to the length of that given segment, because remember when we set this width, it's equivalent to us setting the length of the radius of the circle that we're going to sketch, so just make sure that that compass width is set to the length of that given segment. You want to go down to your ray, line that up, I'm going to swing the compass up, and with a light hand I'm going to arc, okay? Just kind of cut through that ray right there.

Now this point where the arc intersects that ray, right here, I'll call this segment CD, just to be able to reference it and I'll call this segment AB. I've constructed CD, which is congruent to AB. These segments have the same length, okay? Now that's how you use the compass to perform that construction.

Now, let's take a minute and really justify why this construction is true, why it actually works, okay? All right. Come with me. Take a look at what we have here. Now here we have a given line segment, right? Remember when I said in our introduction that normally we're going to sketch arcs of circles instead of the entire circle? But here, I wanted you to really see that whole circle. If we would have swung that compass all the way around, and really completed that circle, that's what it would have resembled.

Now remember, when we set our compass width equal to the length of that line segment that we were given, we were guaranteeing that our circle that we sketched, that the radius of it had the same length. What we did, is we guaranteed that that line segment was congruent to the length of our radius.

That's what justifies that construction. The radius of that circle, has the same length of that given line segment, all right? Okay, good job on that. All right guys, you've reached the conclusion of this topic of how to use the compass and the straight edge to construct a line segment congruent to a given line segment. I hope you saw how your knowledge of circles came in handy for you during this topic. Bye.