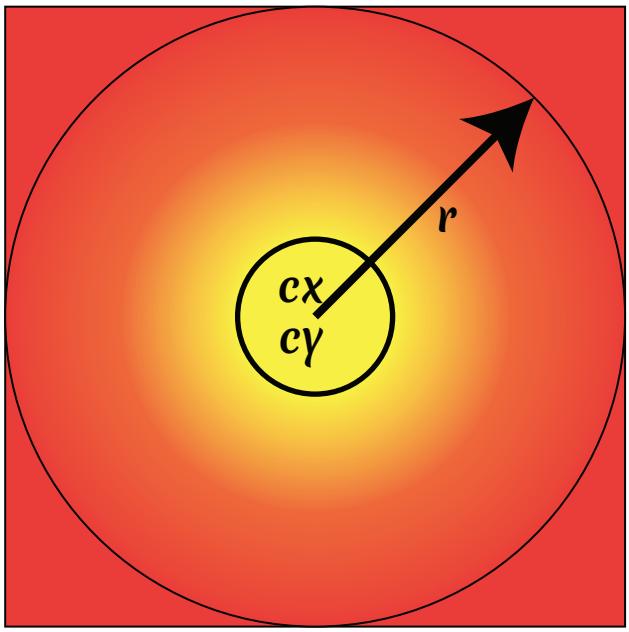
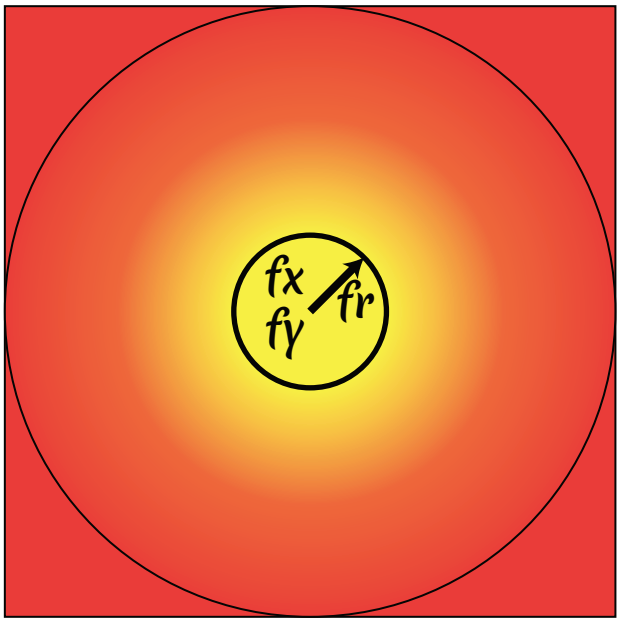
# lesson 5

# RADIALGRADIENT




In the first module, I created a radial gradient element id=" first", which contains stop elements. The gradientUnits attribute is set to userSpaceOnUse.

1.1 Let's add an outer circumference or, in other words, an outer normal of the gradient by adding a cx attribute with a value of 500, a cy attribute with a value of 500, and an r attribute with a value of 400. You may have noticed that cx, cy, and r are attributes, they aren't the geometry properties. They have a completely different meaning when they used in a radialGradient element. As you know, the normal of the radial gradient is a circumference. In our case, the vector will start at the center of the circle and be drawn at the point with coordinates of r. Let's look at the result. Everything works as we expected.

1.2 Now let's add an inner or focal circumference using fx, fy, fr attributes. The attribute fx equal to 500, the attribute fy is equal to 500 and the attribute of the fr is equal to 200. We can see that the initial normal is a circumference with a radius of 200 pixels. Thus, the gradient starts with a circle with a radius of 200 pixels and ends with a circle with a radius of 500 pixels.

1.3 To see this, let's add two circles after the rect element. The first circle has the following geometry properties cx="500" cy="500" r="400", fill="none" stroke="black" and the second circle has the follow - ing geometry properties cx="500" cy="500" and r="200", fill="none" stroke="black". In this manner, we simulate the focal and external normals.

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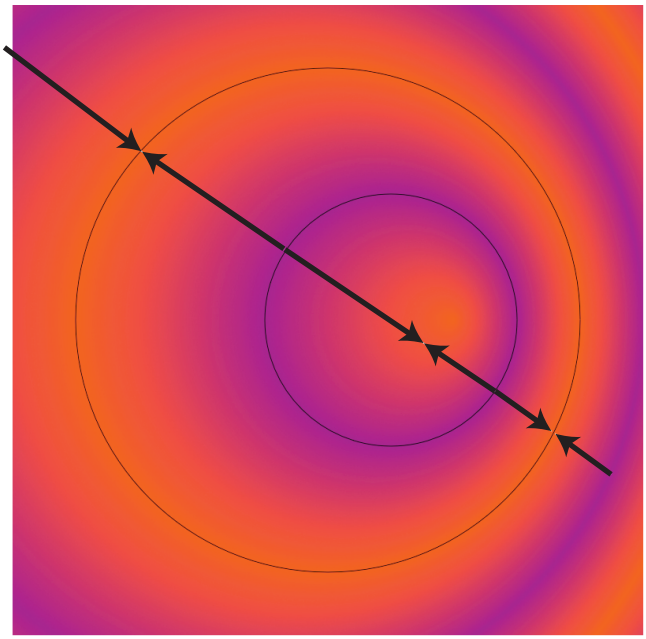


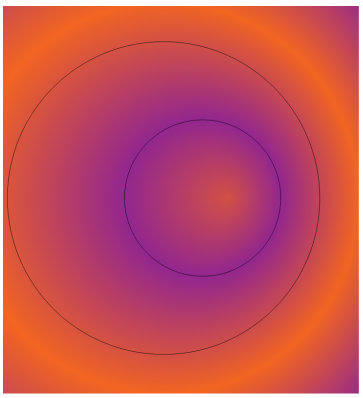
In the second module, we will find out how fx, fy can affects the radial gradient.
2.1 Let's change the position of the focal circle. To do this, change the value of fx from 500 to 600, the value of fy from 500 to 520. The gradient has changed.
For the second circle at the bottom of the svg element [to see the boundaries of the focal circle]: change the value of the cx geometry property to 600, the value of the cy geometry property to 520,

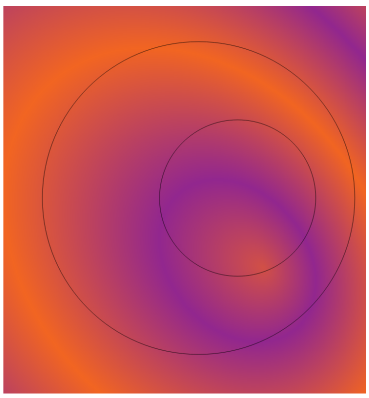
Now we can see that the focal circle has shifted. As I said, we know that the gradient normals will start from the focal circle and follow to the external circle.

2.2 Let's change the value of the spreadMethod from pad to reflect.

In the third module, you will check whether the percentages of the radial gradient work.
3.1 Change the value of the gradientUnits attribute from userSpaceOnUse to objectBound ingBox (default value). Change the values of the cx, cy, r, fx, fy, and fr attributes to get the same result as in the previous module.

In the fourth module, you can see two SVG elements with exactly the same code. I create it for a demonstration of how the gradientTransform attribute works.





You can apply transformations not only to shapes but also to the gradient elements. You should use the gradientTransform attribute rather than the transform attribute to do so.

4.1 Add the gradientTransform attribute with the value skewX(15) to the radial gradient located in the second SVG element. Look at the changes.
4.2 Then change the value of the gradientTransform to skewX(25), then change the value of gradientTransform to skewY(15). You could see the changes that happened to the gradient.

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In the fifth module, you have to rotate the second gradient 180 degrees around the focal point.