

## Lesson 5 Summary

The circumference of a circle is the distance around the circle. This is also how far the circle rolls on flat ground in one rotation. For example, a bicycle wheel with a diameter of 24 inches has a circumference of  $24\pi$  inches and will roll  $24\pi$  inches (or  $2\pi$  feet) in one complete rotation. There is an equation relating the number of rotations of the wheel to the distance it has traveled. To see why, let's look at a table showing how far the bike travels when the wheel makes different numbers of rotations.

number of rotations	distance traveled (feet)
1	$2\pi$
2	$4\pi$
3	$6\pi$
10	$20\pi$
50	$100\pi$
$x$	?

In the table, we see that the relationship between the distance traveled and the number of wheel rotations is a proportional relationship. The constant of proportionality is  $2\pi$ . To find the missing value in the last row of the table, note that each rotation of the wheel contributes  $2\pi$  feet of distance traveled. So after  $x$  rotations the bike will travel  $2\pi x$  feet. If  $d$  is the distance, in feet, traveled when this wheel makes  $x$  rotations, we have the relationship:

$$d = 2\pi x$$