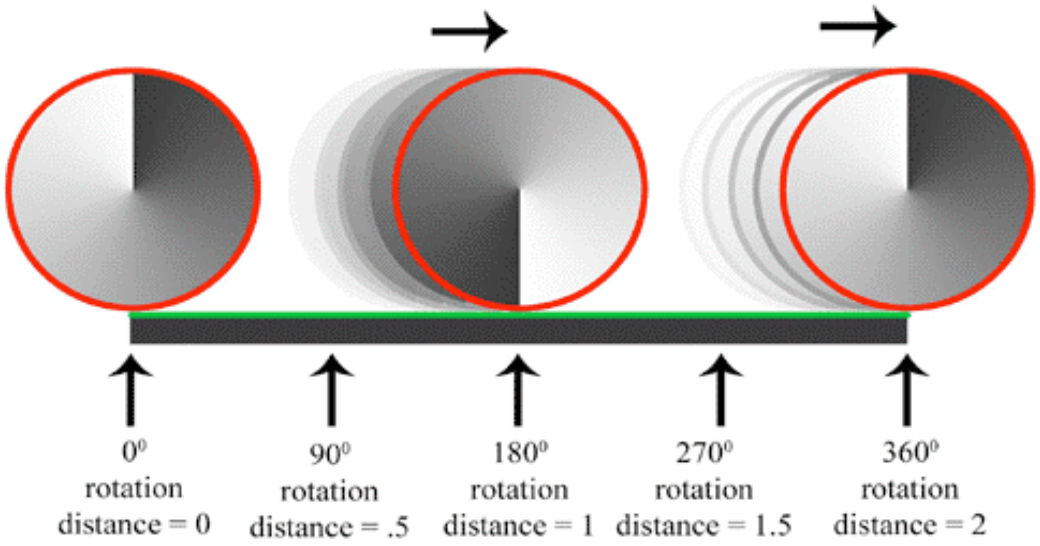
- *The **red line** around the wheel is equal in length to the **green line** on the ground, they both have a length of 2, and the wheel is rolling from left to right.*



- *Notice that when the wheel has made 1/2 a rotation (180°), the wheel travels 1/2 the distance of its circumference, which means it has moved a distance of 1.*
- *Also notice that when the wheel has made a full rotation (360°), the wheel has traveled the full distance of its circumference, which means it has moved a distance of 2.*
- *If we divide the distance the wheel travels by its circumference, we get a fractional answer. We can multiply this fractional answer by 360° to find out how much the wheel should rotate to travel this distance. For instance:*

Example A

distance_traveled ÷ ***circumference***
= ***1*** ÷ ***2***
= ***1/2***
(1/2 of 360° = 180°) *(multiply 1/2 by 360)*
We can say from this that when the wheel has traveled a distance of 1, it has to have rotated 180°.

Example B

distance_traveled ÷ ***circumference***
= ***1.5*** ÷ ***2***
= ***1.5/2***
= ***3/4***
(3/4 of 360° = 270°)
We can say from this that when the wheel has traveled a distance of 1.5, it has to have rotated 270°.

Example C

distance_traveled ÷ ***circumference***
= ***7*** ÷ ***2***
= ***7/2***
(7/4 of 360° = 1260°)
We can say from this that when the wheel has traveled a distance of 7, it has to have rotated 1260°.

- *The type of math used in examples A, B, and C is the same type used in our Car expression, but with different values plugged in.*

  FrontAxle.rotateZ = Car.translateX / - (2* *3) * 360

- *FrontAxle.rotateZ is what we are trying to determine based on the Car.translateX value. In this case:*

  distance traveled = ***Car.translateX***
  circumference = ***(2* *3)***
- *We know the **circumference** of the wheel because the radius = 3, and the formula for the circumference of a wheel is **C=2* *r.***
- *We know the **distance traveled** because it is indicated by the Car's translate X value, which is determined by how far we move the car.*
- *A negative sign is placed in front of the right side of the equation because if you don't, the wheel spins in the wrong direction. This was figured out by trial and error.*