**Proportional Relationship**

When your robot drives forward or reverse, it is following a linear path. When an object moves from one point to another in a straight line, it is known as linear movement. There is a direct**proportional relationship** between how much the motors spin, how much the wheels spin, and how much the robot moves.  
  
You can calculate how far the robot will travel by using the wheel’s diameter and circumference. The diameter is the measurement of a straight line across the shape of a circle. Circumference is the total measurement that goes around the circle.  
A close up of a wheel

Description automatically generatedDiameter and circumference  
  
  
  
These two formulas can be used to find the distance travelled by the robot:  
A close-up of a math test

Description automatically generatedFormulas  
  
  
Let’s do an example. If TACObot’s wheels spin a total of 3 rotations, how far has it traveled?  
To find the distance traveled, you first need to find the circumference of the wheel. If you measure the diameter of TACObot’s wheel, it is 5.6cm.  
A screenshot of a math problem

Description automatically generated with medium confidenceFind wheel circumference

Now we know the circumference of TACObo’ts wheel is 17.5cm. Let’s find the distance traveled for 3 rotations.

A diagram of a wheel with text and numbers

Description automatically generated with medium confidenceFind distance traveled

We multiplied the circumference by the number of rotations to get the amount the robot has traveled, which is 52.5cm.

**Try It! Distance for 12 rotations**

Can you calculate how far the robot will travel if the wheels spin 12 rotations? Work it out! Don't forget these formulas:  
A close-up of a math test

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