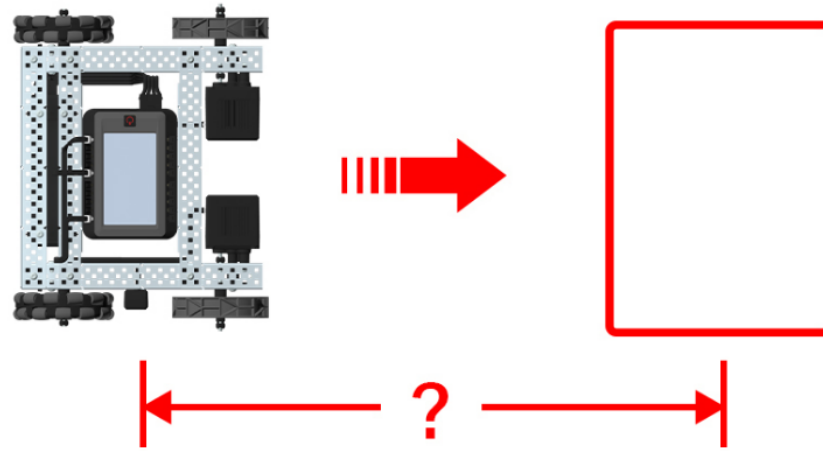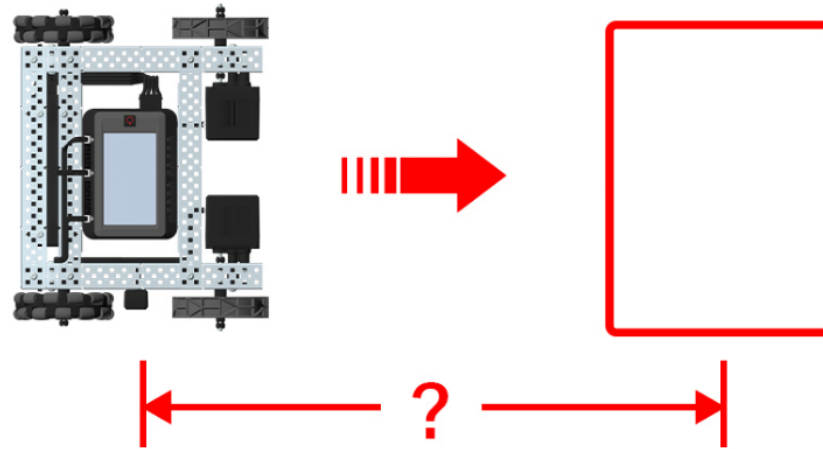# Travelling a set Distance….
Ratios & Proportions

Before you start (Need to knows)

- Circumference of Wheel = πD

- How far you will travel in one rotation of the wheel

Travelling a set Distance....
Ratios & Proportions

Math

Wheel Circumference = $\pi \ x \ 2.5"$

Wheel Circumference = 3.1415 * 2.5"

1 rotation of the wheel it travels 7.8539"

Ratio is 7.85":1 = $\dfrac{7.8539"}{1 \ Rotation}$

Proportion

1 rotation = 7.8539"   **Ratio is 7.85:1"**

Distance Travelled in 5 rotations   **5 x 7.8539" = 39.2699"**

Rotations need if travelling 24"   **24" ÷ 7.8539" = 3.0558"**

Turning Precisely....
Ratios & Proportions
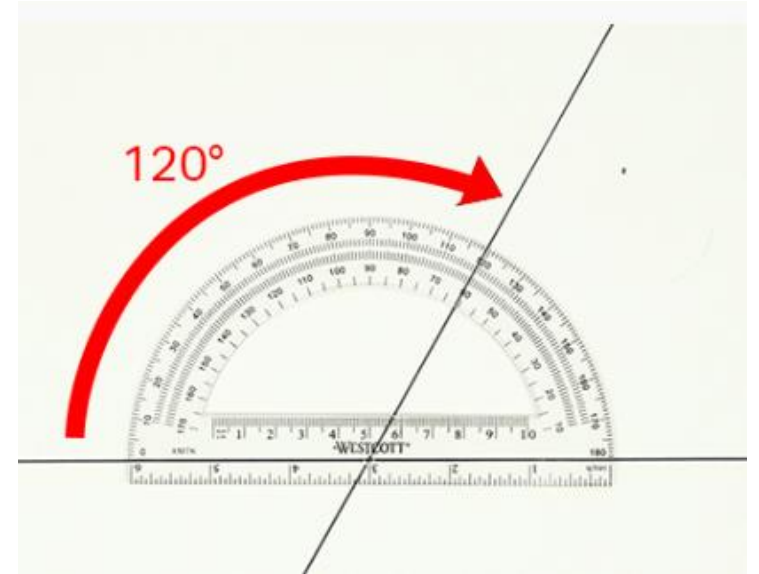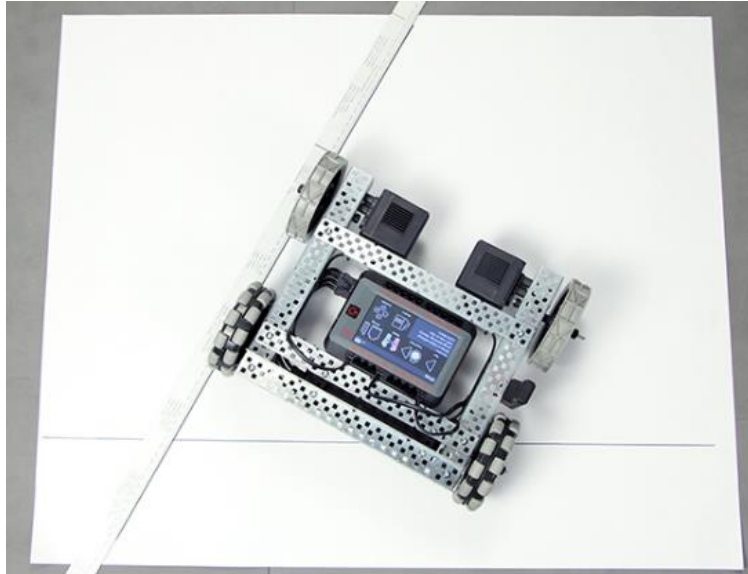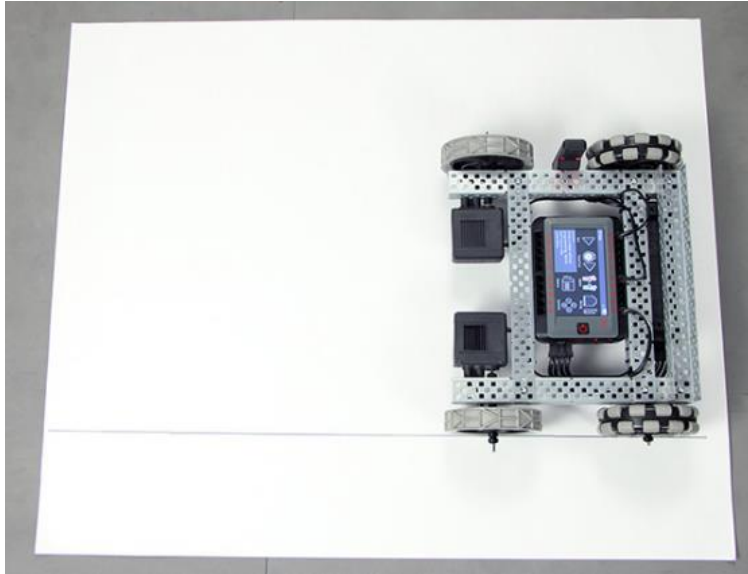
Proportions for turning

1 rotation = 132^0 **Ratio is 120^0 :1 or** $\dfrac{132^0}{1\ Rotation}$

Wanting to Rotate 180^0 $180^0 \div \dfrac{132^0}{1\ Rotation} = 180^0\ X\ \dfrac{1 Rotation}{132^0}$

Rotations need to travel $180^0 = \dfrac{180^0}{132^0} = $ **1.36 rotations**

Ratios & Proportions
Mathematical Equations

Distance Travelled	
$$\frac{7.8539"}{1\ Rotation} = \frac{Distance\ to\ Travel}{\#\ rotations}$$	
I want to go 5 rotations	I want to travel a distance of 24"
$$\frac{7.8539"}{1\ Rotation} = \frac{Distance\ to\ Travel}{\#\ rotations}$$ $$\frac{7.8539"}{1\ Rotation} = \frac{x}{5}$$ X = 5 * 7.8539 X = 39.2695"	$$\frac{7.8539"}{1\ Rotation} = \frac{Distance\ to\ Travel}{\#\ rotations}$$ $$\frac{7.8539"}{1\ Rotation} = \frac{24"}{x}$$ 7.8539x = 24 $$X = \frac{24"}{7.8539}$$ X = 3.0558 rotations

Amount of Degrees of Rotation	
$$\frac{132^0}{1\ Rotation} = \frac{Distance\ to\ Rotate}{\#\ rotations}$$	
Degrees after 5 rotation	I want Rotate 180^0
$$\frac{132^0}{1\ Rotation} = \frac{Degrees\ to\ Rotate}{\#\ rotations}$$ $$\frac{132^0}{1\ Rotation} = \frac{x}{5}$$ X = 5 * 132 X = 660^0	$$\frac{132^0}{1\ Rotation} = \frac{Degrees\ to\ Rotate}{\#\ rotations}$$ $$\frac{132^0}{1\ Rotation} = \frac{180^0}{x}$$ 132x = 180 $$X = \frac{180}{132}$$ X = 1.36 rotations

Maze Assignment

STEP #1	Measure the distance CENTRE to CENTRE of each leg of the trip and record it on a piece of paper	
STEP #2	Convert ALL the distances to ROTATIONS using the equations you have learned	
STEP #3	Calculate your Turning ROTATION precisely	
STEP #4	Program the robot	
STEP #5	Complete the challenge in the FIRST TRY!!!	

End

Start