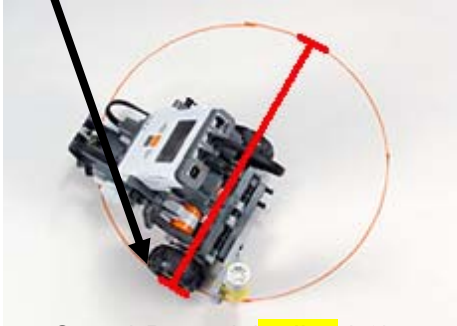
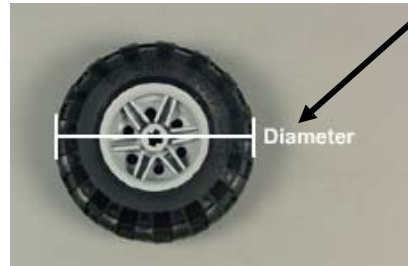


Brian wants his robot to make a swing turn of **180 degrees** and his robot traces a circle with a **radius of 17.5 cm**. The wheels on his robot have a **diameter of 9cm**. How many degrees must he program the wheels on his robot to rotate in order to make this turn? (*Brian quiere que su robot de una vuelta de 180 grados. Su robot traza un circulo con un radio de 17.5 cm. Si su robot tiene ruedas con un diametro de 9 cm cuantos grados tiene el que programar su robot para que haga esta vuelta ?*)



$$C = \pi * D = \pi * (\text{radius} * 2) \\ = 3.14 * (17.5 \text{ cm} * 2) \\ = 109.9 \text{ cm}$$



$$C = \pi * D \\ = 3.14 * 9 \text{ cm} \\ = 28.26 \text{ cm}$$

$$\begin{aligned} \frac{\text{Angle Turned}}{\text{Full Circle}} &= \frac{\text{Distance Traveled by Wheel}}{\text{Circumference of Traced Circle}} \\ 109.9 \text{ cm} * \frac{180 \text{ degrees}}{360 \text{ degrees}} &= \frac{\text{Distance}}{109.9 \text{ cm}} * 109.9 \text{ cm} \\ 109.9 * .5 \text{ cm} &= \text{Distance} \\ 54.95 \text{ cm} &= \text{Distance Traveled by the wheel} \end{aligned}$$

$$\begin{aligned} \frac{\text{Distance Traveled by Wheel}}{\text{Wheel Circumference}} &= \frac{\text{motor degrees}}{360^\circ} \\ 360 \text{ degrees} * \frac{54.95 \text{ cm}}{28.26 \text{ cm}} &= \frac{28.26 \text{ cm}}{28.26 \text{ cm}} * \frac{\text{Motor Degrees}}{360 \text{ degrees}} * 360 \text{ degrees} \end{aligned}$$

$$360 \text{ degrees} * 1.94 = \text{Motor Degrees}$$

$$698.4 \text{ degrees} = \text{Motor Degrees}$$

Brian must program his robot with a rotation of 698 degrees in order for it to make a swing turn of 180 degrees. (*Brian necesita programar su robot con 698 grados de rotacion para que su robot haga una vuelta de 180 grados.*)