

21. Circumference Equations

Name _____

Directions: Please show all work, describe how you got the answer, and circle your final answer. If you use a calculator, say so, but also write out the calculations you did with the calculator.

The Problem: Mathys did the following calculations to figure out how many degrees of wheel rotation it took his robot to make a full 360-degree swing turn with the standard wheels. First, he calculated the circumference of the standard wheels, which have a diameter of 5.5cm:

$$5.5 \text{ cm} * 3.14 = 17.27 \text{ cm}$$

Second, he calculated the circumference of the circle traced by his robot's wheel in a swing turn, knowing that the width of his robot from wheel to wheel was 14.5 cm:

$$2 * 14.5 \text{ cm} * 3.14 = 91.06 \text{ cm}$$

Third, he calculated the number of rotations of the standard wheel required to make a full turn:

$$91.06 \text{ cm} / (17.27 \text{ cm/wheel rotations}) = 5.27 \text{ wheel rotations}$$

Finally, he converted wheel rotations to degrees:

$$5.27 \text{ wheel rotations} * 360 \text{ degrees/wheel rotation} = 1898 \text{ degrees}$$

If Mathys decided to use the smaller wheels (diameter of 3cm), what would be the degrees of wheel rotations required to make a full 360-degree swing turn?