A Remembrance of Things Past ~ ~ ~

#1/1 [§6.1: p. 477; #81] Speed of a Car

The wheels of a car have a radius of 11 in. and are rotating at 600 rpm. Find the speed of the car in mi/h.

**Solution:**

1. There is little trig here. This is mostly an exercise in conversion of units. To work this problem, you must know:

   - 1 ft. = 12 in., 1 mi. = 5280 ft, 1 hr. = 60 min.

2. You must also know "rpm" means "revolutions per minute," and "per" means "divided by."

   - Also, a "revolution" of a circle means the length of the circumference: \( C = 2\pi r. \)

3. We convert: 600 rpm = \( \frac{600 \text{ rev}}{\text{min}} = \frac{600}{1} \text{ rev/min} \)

   \[ = \frac{600 \cdot 2\pi \text{ in}}{\text{min}} \]

   \[ = \frac{600 \cdot 2\pi \text{ ft}}{\text{min}} \]

   \[ = \frac{600 \cdot 2\pi \text{ mi}}{5280 \text{ ft}} \]

   \[ = \frac{600 \cdot 2\pi \cdot 60 \text{ mi}}{12 \cdot 5280 \text{ ft}} \]

4. Normally, one writes out the conversion in one line, like \((*)\), rather than building up to it as I did —for educational purposes.

5. Final Answer: The speed of the car is approximately 39.3 mph.