**Quiz 4 Practice Quiz**

The questions refer to an Arduino microcontroller connected to a DC motor with a speed controller, as in Lab 4. The microcontroller outputs a pulse-width modulated 0-to-5V signal at pin pinSpeed_Left to set the speed reference $V_{ref}$. In steady state the speed controller ensures that the sensed speed voltage $V_s$ equals the reference $V_{ref}$. The speed sensor gain is:

$$ K_{sense} = \frac{V_s}{\omega} = 0.25 \frac{V}{(rad/s)} $$

The microcontroller starts or stops the wheel rotation by setting the pin pinCW_Left logic high or logic low, respectively. Initially, the wheel is stopped. The following lines of code perform the tasks described in the comments:

```c
analogWrite(pinSpeed_Left, 51);  // set speed reference, duty-cycle = 51/255
digitalWrite(pinCW_Left, HIGH);  // go clockwise
delay(4500);    // for _____ seconds
_____________________________;  // stop
```

1. **What is the steady-state wheel speed $\omega$ (in rad/s) during the time the wheel is rotating?**

2. **How long does the wheel rotate (in seconds)?**

3. **Write the line of code that stops the wheel: fill in the blank in the 4th line of code above.**