Flipping Physics Lecture Notes:

Introductory Angular Velocity Problem
A Turning Bike Tire

Example: The wheel of a bike rotates exactly 3 times in 12.2 seconds. What is the average angular velocity of the wheel in (a) radians per second and (b) revolutions per minute?

Knowns: $\Delta\theta = \text{"exactly"}3\,rev;\ \Delta t = 12.2\,\text{sec};\ \omega_{avg} = ?\ (a)\left(\frac{rad}{s}\right)\ \&\ (b)\left(\frac{rev}{\text{min}}\right)$

Note: Unfortunately the word “exactly” is sometimes used in physics problems and it means the number referred to has an infinite number of significant digits. Hopefully you recognize this is impossible.

(a) $\omega_{avg} = \frac{\Delta\theta}{\Delta t} = \frac{3\,rev}{12.2\,sec} = 0.24590\frac{rev}{s}\left(\frac{2\pi\,rad}{1\,rev}\right) = 1.54505 \approx \boxed{1.55\frac{rad}{s}}$

(b) $\omega_{avg} = 1.54505\frac{rad}{s}\left(\frac{60\,s}{1\,\text{min}}\right)\left(\frac{1\,rev}{2\pi\,rad}\right) = 14.7541 \approx \boxed{14.8\frac{rev}{\text{min}}}$

Typical mistakes with this conversion:

1) Forget to include the parenthesis around 2π in your calculator and therefore actually divide by two and then multiply by π results in 145.617 which is not correct.
2) Forget to include the number π in your calculations which results in 46.351 which is also not correct.
3) Add π to your answer even though you typed it in to your calculator and therefore already used its value results in 14.8 π which is, you guessed it, also not correct.