Exercise 1

Consider the periodic function depicted in the graph below.

1. What is the period?

2. What is the amplitude?

3. The function graphed above is given by $y = A \sin(Bx)$ for two real numbers $A$ and $B$. What are $A$ and $B$? (Hint: what horizontal and vertical scaling factors have been applied to the graph of $y = \sin(x)$ to result in the graph above?)

$$A = 3, \quad B = 2$$
Exercise 2

A certain type of vinyl record spins at a rate of 45 revolutions per minute (RPM).

1. One revolution corresponds to a full rotation of $360^\circ$. If a record spins at 45 RPM, by how many radians does it turn in one minute?

\[
2\pi \cdot 45 = 90\pi
\]

2. Recall that one minute is equal to 60 seconds. By how many radians does the record turn in one second?

\[
\frac{90\pi}{60} = 1.5\pi \text{ radians per second}
\]

3. The diameter of a standard vinyl record is 12 inches. What is the linear speed of a point on the outside edge of the record, in inches per second, if it turns at 45 RPM?

\[
\nu = \omega \cdot r = \frac{60 \cdot 1.5\pi}{90\pi} = \frac{1}{6} \text{ in/sec.}
\]