5. [11 points] For each of the following statements, circle the correct answer. **Only one** correct answer is given for each statement. You do not need to show any work for this problem.

a. [2 points] A circle is centered at the point \((3, -1)\) and has radius 2. Starting at the point \((5, -1)\) on the circle, after rotating counter-clockwise by the angle \(\alpha\), the \(y\)-coordinate of the corresponding point on the circle must be:

\[
\begin{align*}
2 \cos(\alpha) - 1 & \quad 2 \cos(\alpha) + 3 & \quad 2 \sin(\alpha) - 1 & \quad \text{NONE OF THESE}
\end{align*}
\]

b. [2 points] If the **continuous** annual growth rate of an exponential function is 40\%, then the non-continuous annual growth rate is:

\[
\begin{align*}
40\% & \quad 100(e^{0.6} - 1)\% & \quad e^{0.4}\% & \quad \text{NONE OF THESE}
\end{align*}
\]

c. [2 points] If \(\theta\) is any angle given in radians, then \(\cos(\theta + \pi)\) must be equal to:

\[
\begin{align*}
\cos \theta & \quad \sin(-\theta) & \quad -\cos(\theta) & \quad \text{NONE OF THESE}
\end{align*}
\]

d. [2 points] Let \(f(w)\) be a non-constant function with domain \((-\infty, +\infty)\) that satisfies \(f(w) + f(-w) = 1\) for all \(w\) in \((-\infty, +\infty)\). Then \(g(w) = \frac{1}{2} - f(w)\) must be:

\[
\begin{align*}
\text{odd} & \quad \text{even} & \quad \text{neither odd nor even} & \quad \text{CANNOT BE DETERMINED}
\end{align*}
\]

e. [3 points] If \(k(w) = A \sin(w) - 3\) is a periodic function with amplitude 2, then \(k(\frac{\pi}{7})\) must be equal to:

\[
\begin{align*}
0 & \quad -1 & \quad 1 & \quad -5 & \quad \text{CANNOT BE DETERMINED}
\end{align*}
\]