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 α, the y-coordinate of the corresponding point on the circle must be:

$2\cos(\alpha) - 1$ $\quad$ $2\cos(\alpha) + 3$ $\quad$ $\boxed{2\sin(\alpha) - 1}$ $\quad$ NONE OF THESE

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

40% $\quad$ $100(e^{0.6}-1)\%$ $\quad$ $e^{0.4}\%$ $\quad$ $\boxed{\text{NONE OF THESE}}$

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

$\cos\theta$ $\quad$ $\sin(-\theta)$ $\quad$ $\boxed{-\cos(\theta)}$ $\quad$ NONE OF THESE

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:

$\boxed{\text{odd}}$ $\quad$ even $\quad$ neither odd nor even $\quad$ CANNOT BE DETERMINED

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

0 $\quad$ -1 $\quad$ 1 $\quad$ -5 $\quad$ $\boxed{\text{CANNOT BE DETERMINED}}$

