

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:

$2 \cos(\alpha) - 1$ $2 \cos(\alpha) + 3$ $2 \sin(\alpha) - 1$ 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% $100(e^{0.6} - 1)\%$ $e^{0.4}\%$ NONE OF THESE

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

$\cos \theta$ $\sin(-\theta)$ $-\cos(\theta)$ 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:

odd even neither odd nor even 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 -1 1 -5 CANNOT BE DETERMINED