

10. [15 points] For each of the questions below, circle **all** correct answers. You do not need to show your work for this problem. Make sure your answers are clear.

a. [3 points] The function $f(x) = \sin(x - \frac{\pi}{2})$ is

equal to $\cos(x)$ an even function an odd function
 neither even nor odd none of the above

b. [3 points] Suppose θ is an angle between 0 and 90 degrees. If $v = \sin(\theta)$, then $\cos(180^\circ + \theta)$ is equal to

v $-v$ $\sqrt{1 - v^2}$ $-\sqrt{1 - v^2}$ none of the above

c. [3 points] Suppose a function $A(x)$ has a vertical asymptote of $x = 5$. The function $B(x) = 3A(3x - 6) + 1$ has a vertical asymptote of

$x = -1/3$ $x = 13/3$ $x = 15$ $x = 23/3$ none of the above

d. [3 points] When an ant is given chemical Y, it grows to any given mass in half the time it takes for a regular ant to reach that mass. If $A(t)$ is the mass of a regular ant t weeks after it's born, and $B(t)$ is the mass of an ant given chemical Y, t weeks after it's born, which of the following equalities are true?

$A(t) = 2B(t)$ $2A(t) = B(t)$ $A(t) = B(2t)$

$A(2t) = B(t)$ none of the above

e. [3 points] Let $A > 1$ be a positive number. For which of the following intervals is the function $C(t) = A \cos(t + 1)$ concave down for the entire interval?

$[-1, 0]$ $[0, 1]$ $[\frac{3\pi}{2} - 1, \frac{5\pi}{2} - 1]$ $[\frac{3\pi}{2} + 1, \frac{5\pi}{2} + 1]$ none of the above