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 \( \theta \) 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