PROBLEM:

Define $x(t)$ as

$$x(t) = 20\cos(200\pi t + \pi/2) + A\cos(200\pi t + \phi) \tag{1}$$

How should A and ϕ be chosen so that

$$x(t) = B\cos(200\pi t), \tag{2}$$

where B is a positive real number? What is the value of B for your choice of A and ϕ?

Hint: There are many correct answers to this problem. To solve this problem try a graphical approach. To get a numerical answer, you will have to fix one of the unknowns A or ϕ and solve for the other.