

AB CalcLog 5.5

The twice-differentiable function f is defined for all real numbers and satisfies the following conditions:

$$f(0) = 2, f'(0) = -4, \text{ and } f''(0) = 3.$$

1. The function g is given by $g(x) = e^{ax} + f(x)$ for all real numbers, where a is a constant. Find $g'(0)$ and $g''(0)$ in terms of a . Show the work that leads to your answers.
2. The function h is given by $h(x) = \cos(kx)f(x)$ for all real numbers, where k is a constant. Find $h'(x)$ and write an equation for the line tangent to the graph of h at $x = 0$.