

2006 AB6

6A

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

$$g(x) = e^{ax} + f(x)$$

$$g'(x) = ae^{ax} + f'(x)$$

$$g'(0) = ae^0 + f'(0)$$

$$g'(0) = a - 4$$

$$g'(x) = ae^{ax} + f'(x)$$

$$g''(x) = a^2e^{ax} + f''(x)$$

$$g''(0) = a^2 + 3$$

6B

$$h(x) = \cos(kx)f(x)$$

$$h'(x) = -k \sin(kx)f(x) + \cos(kx)f'(x)$$

$$h'(0) = -k \sin(k \cdot 0)f(0) + \cos(k \cdot 0)f'(0)$$

$$h'(0) = -k \cdot 0 \cdot f(0) + f'(0) = -4$$

$$h(x) = \cos(kx)f(x)$$

$$h(0) = \cos(k \cdot 0)f(0)$$

$$h(0) = f(0) = 2$$

$$\text{Tangent line: } y = -4x + 2$$

May 6, 2006