Find the linearization L(x) of the function $f(x) = \frac{1}{(1+2x)^4}$ at a = 0

Solution:

$$y - f(a) = f'(a)(x - a)$$

$$f'(x) = -4\frac{2}{(1+2x)^5}$$

$$f'(a) = f'(0) = -8$$

$$f(a) = f(0) = 1$$

$$y - 1 = -8(x - 0)$$

$$y = -8x + 1$$

Answer: $y = -8x + 1$