

Question #315228 The slope of the tangent line to the graph of the function $y = 4x^3$ at the point $(3, 108)$ is $\lim_{x \rightarrow 3} (4x^3 - 108)/(x - 3)$. By trying values of x near 3, find the slope of the tangent line.

Solution. First, write $\frac{4x^3 - 108}{x - 3} = 4 \frac{x^3 - 27}{x - 3} = 4(x^2 + 3x + 9)$. So, the slope of the tangent line is $4(3^2 + 3 \cdot 3 + 9) = 108$ and there is no need to try values near 3.

Answer 108.