

3-4 DAY 2

1. A rocket is launching, and its height h in meters is a function of t in seconds (so we are considering the function $h(t)$). Explain what $h'(10) = 1035$ means in language your mom could understand. Your answer must include units.

2. Find the derivative of the function.

(a) $f(x) = xe^{1/x}$

(b) $g(x) = \frac{\tan(2x)}{1+x}$

(c) $y = (1 + x^2)e^x \sec x$

(d) $h(x) = \sin(5x - e^{-5x})$

(e) $f(x) = \sqrt{1 + xe^{-2x}}$

3. Find the equation of the line tangent to the graph of $f(x) = \sqrt{1+x^3}$ when $x = 2$.

4. Find y'' for $y = \frac{1}{(1+\tan x)^2}$.

5. If the equation of motion of a particle is given by

$$s = A \cos(\omega t + \delta)$$

a particle is said to undergo simple harmonic motion. Find the velocity of the particle at time t and determine when the velocity is zero.

6. The brightness of a star is give by

$$B(t) = 4.0 + 0.35 \sin\left(\frac{2\pi t}{5.4}\right)$$

where t is measured in days. Find the rate of change of brightness after one day and interpret your answer.