

From Reddit

Topic: Calculus 1 Difficult Question

My tutor and I keep getting this wrong. Does anyone know to solve this? Thank you!!!! Find the absolute maximum and absolute minimum values of f on the given interval.

$$f(t) = t - t^{1/3}, [-1, 3]$$

Solving for an Initial Condition

Objective:

- Find the particular solution of an integration using initial conditions.

The general solution of an integration problem involves $+C$.

The particular solution uses an initial condition to find the specific value of C .

Example 1: Given $f'(x) = \sec^2(3x)$ and $f(\pi/4) = 2$, find both the general and particular solutions.

Position

$$s(t)$$

$$s(t) = \int v(t)dt$$

Velocity

$$v(t) = s'(t)$$



$$v(t) = \int a(t)dt$$

Acceleration

$$a(t) = v'(t) = s''(t)$$

Example 2: The acceleration of a particle is represented by the function $a(t) = t + 2e^{t-9}$. Given that $v(9) = 4$, write an equation that represents the velocity of the particle.

Example 3: Given that the graph of $f(x)$ passes through the point $(1,6)$ and the slope of its tangent line is $2x + 1$, find $f(6)$.

Example 4: Find the particular solution to the following if $y'(1) = 3$ and $y(0) = -6$.

$$\frac{d^2y}{dx^2} = 12x^2 + 6x - 4$$

Example 5: The acceleration of a particle is represented by the function $a(t) = t - \cos(t)$. If the initial velocity is 2 and the initial position is -2, write an equation to represent the position of the particle at any time t .