Doing Things With Derivatives

Math 130 - Essentials of Calculus

8 October 2019

Computing Second Derivatives

Example

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1. $f(t) = \frac{1}{6}t^6 - 3t^4 + t$
2. $f(x) = x^3 - 4x + 6$
3. $g(t) = (t-2)(2t+3)$

Basic Physics

If $s(t)$ is a position function, then the velocity is given by $v(t) = s'(t)$ and acceleration is given by $a(t) = v'(t) = s''(t)$.

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1. *Find the velocity and acceleration functions for the object.*
2. *At what times is the object at rest (zero velocity)?*
3. *At what times does the object change direction?*

Tangent Lines

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2. $f(x) = x + \sqrt{x}$ *at* $(4, 6)$

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2. $\sqrt[3]{26}$

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If $C(v)$ is the cost, in dollars, of purifying v gallons of drinking water, and $C'(200000) = 0.26$, estimate the cost of purifying an additional 3000 gallons of water once 200,000 gallons have been processed.