Name _____

Skill Builder: Topic 5.5 – Using the Candidates Test to Determine Absolute (Global) Extrema

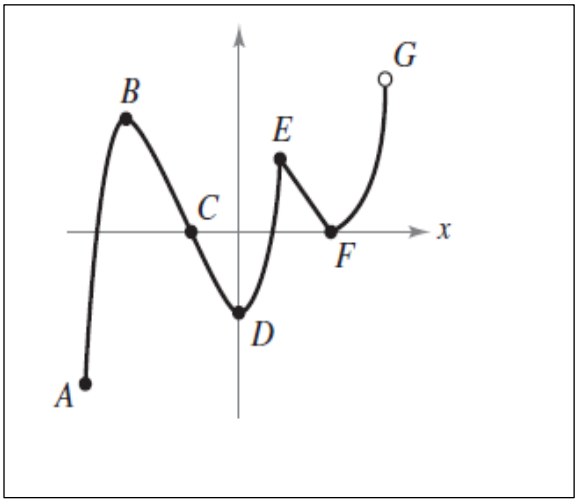
Find the absolute (global) maximum and absolute (global) minimum of the given function over the provided interval.

1.) $f(x) = 4x^2 - 4x + 1 [0, 2]$	**2.)** $f(x) = 6x^3 - 6x^4 + 5 [-1, 2]$
3.) $f(x) = (x^2 - 1)^{\frac{2}{3}} [-2, 3]$	**4.)** $f(x) = \sin x - \cos x \, [0, \pi]$

5.) $f(x) = x - \tan x \left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$

6.) What is the smallest slope of the function $y = x^3 - 3x^2 + 5x - 1$ on $\left[-\frac{1}{2}, 2\right]$?

7.) Determine whether each labeled point is an absolute maximum or minimum, a relative maximum or minimum or neither.



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B	
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8.) Determine whether each statement is True or False. If a statement is false, explain why or give an example that shows it to be false.

a.) The maximum of a function that is continuous on a closed interval can occur at two different values in the interval.

b.) If a function is continuous on a closed interval, then it must have a minimum on the interval.

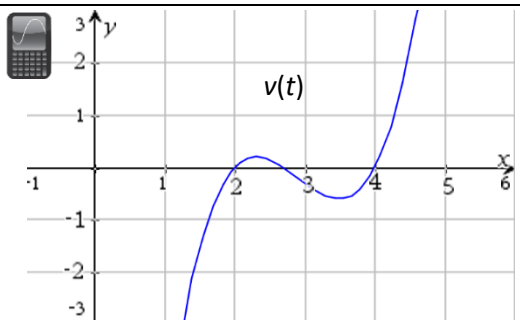
c.) If $x = c$ is a critical number of the function f, then it is also a critical number of the function $g(x) = f(x) + k$, where k is a constant.

d.) If $x = c$ is a critical number of the function f, then it is also a critical number of the function $g(x) = f(x - k)$, where k is a constant.

e.) Let the function f be differentiable on an interval I containing c. If f has a maximum value at $x = c$, then $-f$ has a minimum value at $x = c$.

f.) A quaratic function has a derivative defined by the cubic function $f'(x) = ax^3 + bx^2 + cx + d$ where $a \neq 0$ will always have exactly three critical numbers.

9.) A particle moves along the x-axis such that its position is $x(t) = 0.25t^4 - 2.916t^3 + 12.25t^2 - 22t + 21.6$ for $1 \leq t \leq 4$. A graph of its velocity is shown to the right. At what time does the particle reach its leftmost position? Where is the particle when it reaches its leftmost position?



10.) If a particle moves along a straight line according to $s(t) = \frac{1}{12}t^4 - \frac{1}{3}t^3 - \frac{3}{2}t^2 + 4t - 7$, find

a.) the maximum and minimum velocity on $0 \leq t \leq 4$.

b.) the maximum and minimum acceleration on $0 \leq t \leq 4$.