

**SOLUTION #4 (8 AM)**

**Solution 1.** (1) *Not correct.  $f(x) = |x|$  is continuous but not differentiable at  $x = 0$ . (2pts)*

(2) *Correct! (2pts)*

**Solution 2.** (1)  $f'(x) = \frac{1 \cdot (x^2+1) - x(x^2+1)'}{(x^2+1)^2} = \frac{(x^2+1) - x \cdot 2x}{(x^2+1)^2} = \frac{-x^2+1}{(x^2+1)^2}$  (2pts)

(2)  $g'(x) = [3(x^2 - 1)^{\frac{1}{2}}]' = 3 \cdot \frac{1}{2}(x^2 - 1)^{-\frac{1}{2}}(x^2 - 1)' = \frac{3}{2}(x^2 - 1)^{-\frac{1}{2}} \cdot 2x = 3x(x^2 - 1)^{-\frac{1}{2}}$  (2pts)

(3)  $h'(x) = (x^2)' \cdot (2x+3)^3 + x^2[(2x+3)^3]' = 2x \cdot (2x+3)^3 + x^2 \cdot 3(2x+3)^2 \cdot (2x+3)' = 2x(2x+3)^3 + x^2 \cdot 3(2x+3)^2 \cdot 2 = 2x(2x+3)^3 + 6x^2(2x+3)^2$  (2pts)