

MATH 112 – EXAM I Hints and Answers
Winter 2017

1. (a) $f'(x) = (5 - 7x^3) \cdot \frac{1}{3}(x^4 + 2x)^{-2/3}(4x^3 + 2) + (x^4 + 2x)^{1/3}(-21x^2)$
(b) $\frac{dy}{dx} = 8 \left(\frac{x^5 + 1}{2 - 3x^2} \right)^7 \left[\frac{(2 - 3x^2)(5x^4) - (x^5 + 1)(-6x)}{(2 - 3x^2)^2} \right]$
(c) $D'(t) = 3t^2 - \frac{1}{2}t^{-1/2} + 4t^{-2}$
 $D''(t) = 6t + \frac{1}{4}t^{-3/2} - 8t^{-3}$
2. (a) \$4870
(b) $x = 23$ units
(c) from $x = 0$ to $x = 73.7$ units
(d) $TC(x) = 800 + x + 0.2x^2$, $MC(x) = 1 + 0.4x$
(e) $MC(500) = 201$, $MC(700) = 281$. So the 701st costs more to produce.
(f) $x = 61$ units
3. (a) ii, i, iv, iii
(b) $t \approx 3, 9, 15$ minutes
(c) from $t \approx 3$ to $t \approx 9$ minutes and from $t \approx 15$ to $t \approx 20$ minutes
4. (a) The red car travels 10.5 feet and the green car travels 9 feet in the first three minutes. So the red car travels farthest.
(b) $G'(t) = 6 - 2t$
(c) $t = 1$ minute